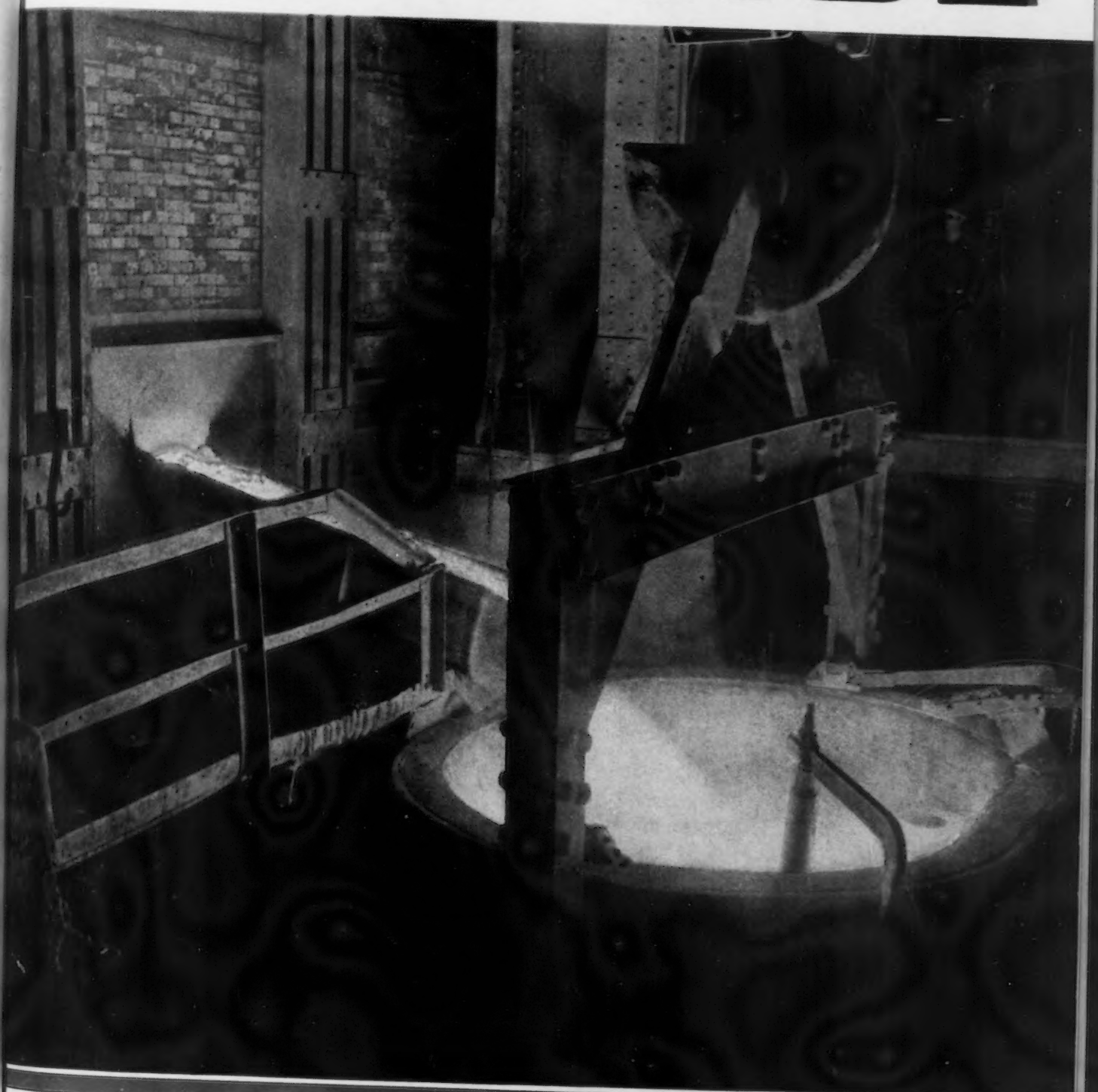
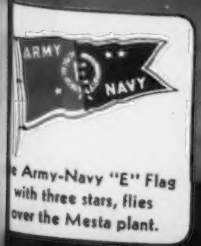
SEPTEMBER 16, 1943

The IRON AGE

SEP 16 1943





e Army-Navy "E" Flag
with three stars, flies
over the Mesta plant.

Pouring Open Hearth Steel
From One of the Furnaces at Mesta

MESTA MACHINE COMPANY · PITTSBURGH, PA.

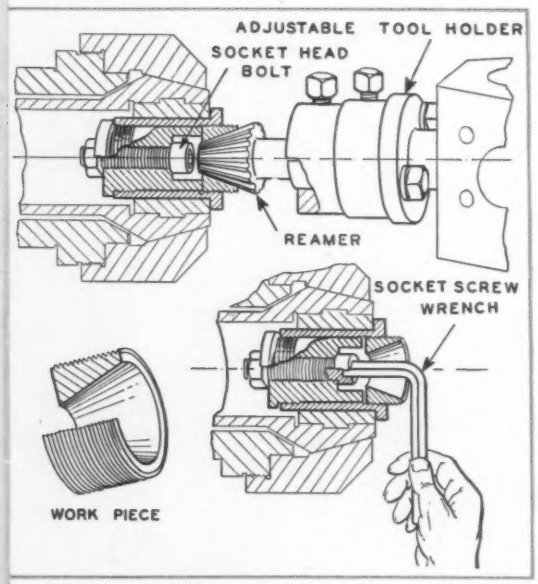
Ideas for VICTORY

from the Production Lines behind the Firing Lines

IDEAS FOR VICTORY
J. D. BOSSET
AWARDED BY WARNER & SWASEY

A Citation for Men in War Industry

Putting a Movable Backstop in the Jig Solved this Problem



J. D. Bosset, turret lathe operator at the Canadian Vickers, Ltd., Montreal Canada, was up against a second operation job that presented difficulties A small threaded piece had to be held in a threaded adapter for taper reaming the bore. The pressure of the reamer so tightened the work piece against the bottom of the jig that it was impossible to screw out the piece after reaming.

Operator Bosset licked the problem by developing a simple holding fixture with a movable backstop. After reaming the piece, a socket wrench inserted through the bore, moves the backstop away from the piece, to relieve the pressure, and permit the finished piece to be easily removed.

A Warner & Swasey "Ideas for Victory" Pin has been sent to operator Bosset in recognition of his initiative and ingenuity. His idea and hundreds of other practical ideas which come to Warner & Swasey are published in "Blue Chips", a shop bulletin sent free to the homes of over 70,000 turret lathe operators. Make sure your operators are on the mailing list—it will bring them helpful ideas and inspiration that can lead to increased production in your plant. Write Warner & Swasey, Cleveland, Ohio.

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This Week in The IRON AGE

Vol. 152, No. 12 — September 16, 1943

Editorial

Modern Porch Climbing 49

o o o

Technical Articles

Screw Machine Steels 52
What Executives Should Know About Purchasing Control 59
Put Carbide Applications in Hands of Specialists 62
Leaf Spring Landing Gear Accepted 64
Intake Pipe Formed from Strip 65
Inspection Time Reduced on Aircraft Parts 66
Cemented Carbide Burring Tools 68
Production and Control in a Small War Plant 70
New Equipment—Motors and Controllers 73

o o o

Features

News Front 51
Assembly Line 78
Washington 82
West Coast 86
Fatigue Cracks 90
Dear Editor 92

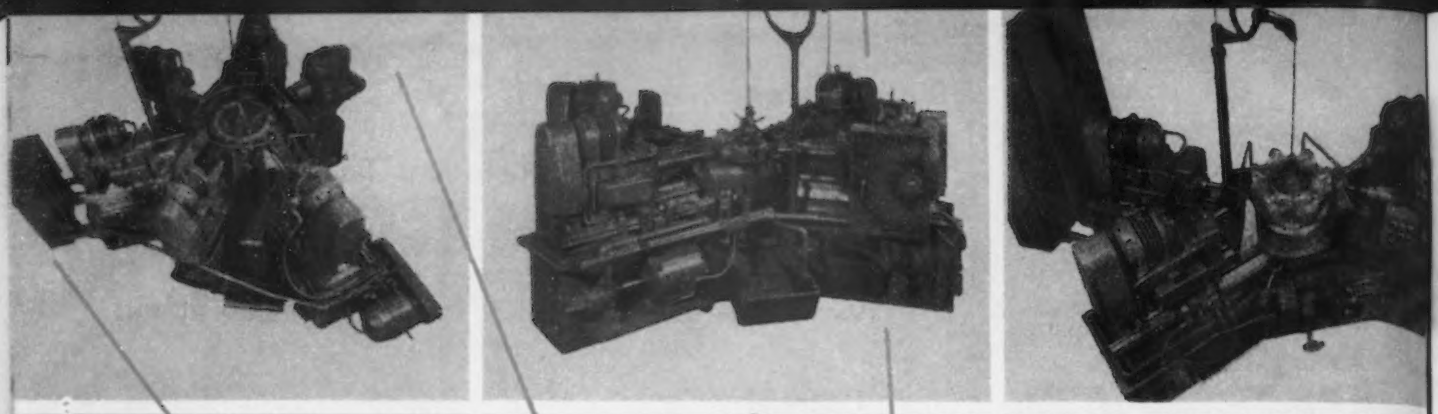
o o o

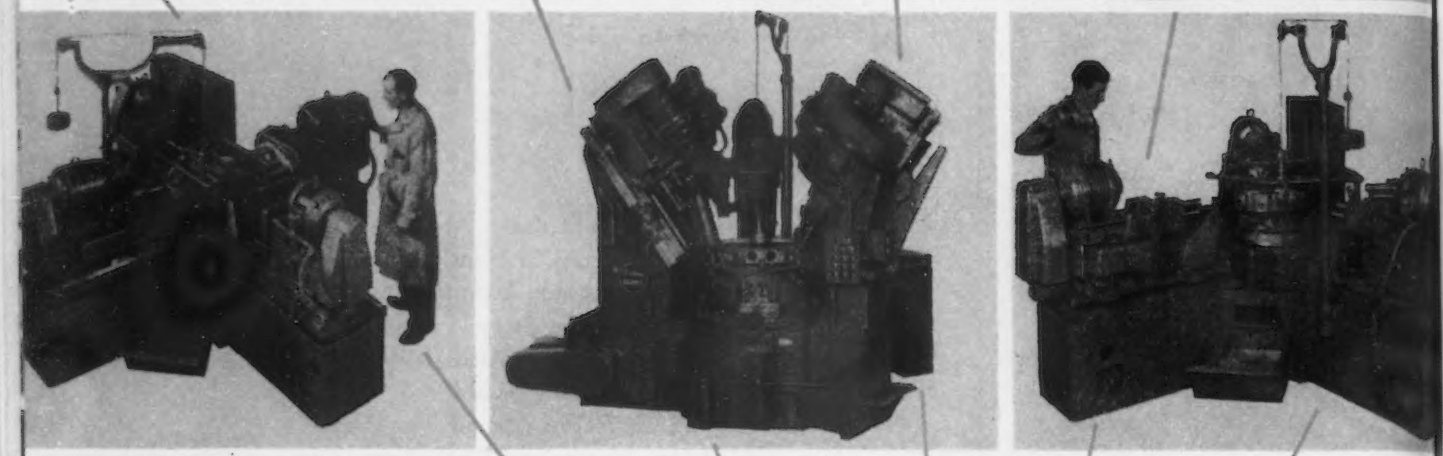
News and Markets

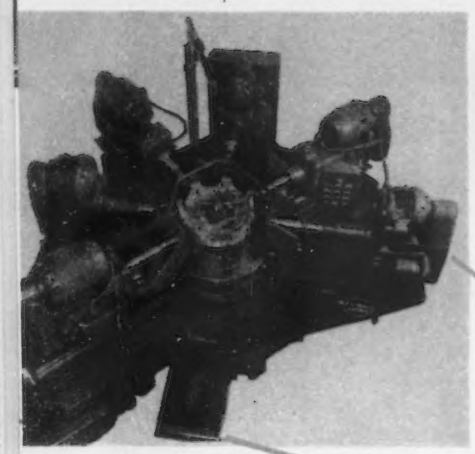
U. S. War Production Pattern to be Kept on its Course 97
Coal Output Affected by "Jitters" of Miners 98
10,000 Machine Tools Available for Transfer 101
Steel Ingot Stockpiling Advocated 101
Brazil, "Drowsing Giant," Awakens 104
Unions Bitter Over Buffalo Labor Priority Plan 106
Personals and Obituaries 150
Machine Tool News 152
Non-Ferrous Metals News and Developments 154
Non-Ferrous Metals Prices; Scrap Prices 155
Iron and Steel Scrap News and Prices 156
Comparison of Prices by Year 158
Finished Iron and Steel Prices 159
NE Steel and Warehouse Prices 160
Stainless Steel, Tool Steel Prices 161
Semi-Finished Iron and Steel Prices 161
Pig Iron Prices 164
Ore and Coke Prices 165
Ferroalloy Prices 166

o o o

Index to Advertisers 253

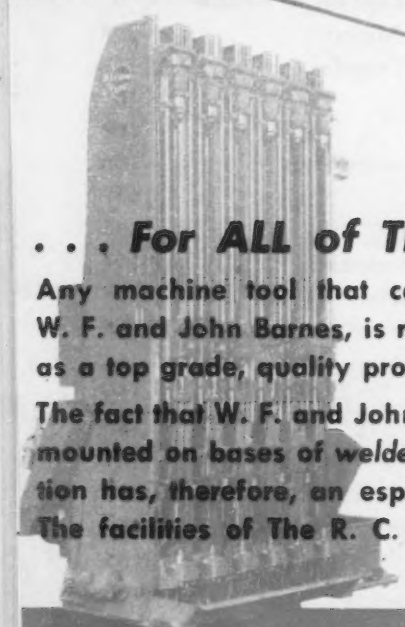






MAHON FABRICATE

Welded STEEL BASES



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Modern Porch Climbing

JIM JONES was an old fashioned manufacturer. He lived in the good old days when a rose by any other name would smell as sweet and when a pretty name could not camouflage a skunk cabbage.

Jim paid his taxes of those days on the nail, probably grumbling about them as people always have and will, but paying them nevertheless. And saying, after paying them: "Thank God, that's over."

One day, one of Jim's important customers paid his account. It was a sizeable one for those times, amounting to over $10,000. Honest Jim took the money home with him that night, for it was a cash transaction and the banks were closed. He stuck half of the money in a bureau drawer and put the other half of it under his pillow.

It so happened that Percy the Porch Climber had followed Jim home, attracted by the unusual bulge in his pants' pocket. Percy could sense money in another man's jeans further even than Mussolini could smell a mixture of Italian garlic and French perfume.

That night, when honest Jim was sleeping the sleep of the just, Percy climbed his porch and swiped the half of the roll that was in the bureau drawer.

It was a sad blow to Jim. He had not intended to spend the money on himself. On the contrary, he was going to buy more machinery and material with it and put more people to work in his community where people needed work in order to live.

Somehow, when I hear and read about "renegotiation," I can't help but think of Jim. And also of the poor people in his community who suffered because of his loss. And I cannot help but wonder, also, at the vast improvement that has taken place in semantics, or the use of words. Today our experts can make a skunk cabbage sound like a rose if they can keep the customers far enough away from getting its old fashioned smell. No one yet has succeeded in changing that.

Times have changed since honest Jim was laid to rest in the family plot. Today, a manufacturer who thinks he has earned a certain profit because he has fulfilled an "honest to God" contract cannot even hide half of the money safely under his mattress, let alone in the bank. For the "renegotiators" are sure to get him, whether he watches out or not. In the bank or under the bed is all one to them.

Renegotiation is not going to hurt the modern Jims of today nearly as much as it is going to hurt the people who will look to them for employment after the war. In the machine tool industry and other machinery industries, for example, it is likely to put labor on a Government WPA for years to come.

Having "gone through the mill" as a machinist in the machine tool industry, I think I can safely say that labor in that industry, and others would rather have its future in the hands of the Jim Joneses of this country than in the hands of the Jesse Joneses.

J. H. Van Deventer

Howard Coonley Points Out a Critical Situation

Howard Coonley, Director Conservation Division, War Production Board, stresses the critical cutting tool shortage situation in a letter to all industry. Here is what he says—

> "--the cutting tool situation is now so acute...that the War Production Board has launched an intensive campaign to establish definite tool care policies in as many plants as possible."

Conservation of cutting tools is sound practice, good business—at any time. Today it is of vital importance to conserve tools in order to meet the full demands for war production. Cutting tool control and usage methods established under peacetime conditions should be reviewed—stepped up to wartime requirements.

Help increase war output, help bring Victory closer, by conserving cutting tools—"they are weapons, treat 'em right."

INLAND STEEL COMPANY

38 S. Dearborn St. — 50th ANNIVERSARY — Chicago 3, Illinois

Milwaukee Detroit St. Paul St. Louis Kansas City Cincinnati New York

The IRON AGE
SEP. 16, 1943

NEWS FRONT

• The Laramie, Wyo., sponge iron plant, approved just one year ago and scheduled for initial operation last summer, still lacks considerable essential equipment. All items have come slowly from WPB, where sponge iron, as far as the war is concerned, is regarded as "a myth".

• Plenty of talk will run over the dam but no substantial changes in the Renegotiation Act will be made as a result of present hearings before the House Ways and Means Committee. The principal proposed amendments shape up as follows:

• Renegotiation before instead of after taxes: Impossible because of 1942 Revenue Act's carrybacks of losses and of excess profits credits, which means it will be 1946 or even 1947 before present actual taxes are known. These factors have surprised some Committee members and are giving pause to all concerned.

• Renegotiation by formula: NAM already has declared against this because of inequities arising from varying turnover rates. Government doesn't want it either.

• Allowance for post-war reserve funds: Not likely because it would add $5 pre-tax cost for every $1 of post-tax reserve, and in any case is considered in the tax bill bailiwick.

• Renegotiation upward in hardship cases: Nobody is plugging it very hard.

• Exemption of companies whose earnings after taxes don't exceed peacetime rates: Improbable because the view is it would release such companies from the otherwise universal heavier tax burden.

• Incidentally, the English system of profits control is particularly drastic. Allowed is 7½ per cent on the company's own, working capital (ruling out bonds held, etc.) plus a performance lagniappe up to 2 per cent of annual capital turnover. Performance profit on government capital turnover is ⅛ that rate.

• Breath of realism: The German government has notified the Swedish stone industry to halt quarrying of granite ordered for postwar victory monuments.

• The ever-higher pinnacles of aircraft design are the successively improved single-seat fighters, for use in that most difficult theatre of all, the French-German front. Only two British (Typhoon, Spitfire) and two American (Thunderbolt, Mustang) can stand that pace.

• The specially hotted-up Spitfire with Merlin 61 engine, and improved Mustang with Rolls Royce engine, both liquid cooled, are comparatively light-weight, lower-powered, and simple in line, and are probably the best. The Typhoon (liquid cooled) and Thunderbolt (air cooled) are heavy, with 2000+ hp., and both still have a number of operational bugs.

• The fastest aircraft in the world in operational squadrons, is probably the British Mosquito, not a fighter but a twin-engine light bomber. The Mosquito's speed comes not from its wooden construction, but entirely from its shape, likely the most beautiful of anything in the air.

• The Mosquito is not made up of just ordinary plywood, bent over a mold. Rather it is a complicated structure, having an inner skin of thin wood, a middle stiffening of Balsa wood, and an outer skin of thin wood strips built over a mold, in two halves like a lobster shell, and joined together after interior wiring, etc. has been put in. Exceptional manufacturing skill is required to line-up this wood-sandwich with the various fittings, such as engine bearers, undercarriage tackle, etc.

• Fighter decline usually follows this pattern--first, a fighter over France-Germany; second, use as fighter-bomber over France-Germany; third, fighter or fighter-bomber in the Mediterranean theatre; fourth and last, fighter or fighter-bomber against the Japanese.

• Generally speaking, a twin-tailed fighter does not come up to the performance of a single fuselage. The two twin-tail operational types are the Lightning (American) and Focke-Wulf (German). The Focke-Wulf is no longer being built but a few are still in service, but the Lightning is performing very well, primarily in the Mediterranean area.

• The British are almost ready to spring a brand new fighter of exceptional performance, and the U.S. likewise has several equally phenomenal fighters well on the way for the Battle for Germany.

Screw Machine Steels

THE current shortage of alloying elements has forced a review of the application of alloy steel. It has been found as a result of this analysis that alloy steel is being specified where plain carbon and the manganese alloys screw machine steels could be used with satisfactory results.

It must be pointed out, that the screw machine steels containing mainly a higher sulphur content as a means of improving machinability, do not have the all-round mechanical strength of alloy and plain carbon steels. The sulphur is present as an inclusion, and decreases the transverse strength of the material.

Fig. 1 illustrates the location of the sulphide inclusions in a slowly cooled low carbon screw machine steel. The effect of the sulphur content in reducing the transverse strength of steel is shown by Figs. 2 and 3. The American Iron and Steel Institute's 1942 list of Basic Open Hearth Sulphurized Carbon and Acid Bessemer Sulphurized Carbon Steels has an impressive number of these steels, listed in Table 1.

It would appear that this list could be reduced. The Society of Auotomotive Engineers 1942 Handbook lists, under bessemer, 1111, 1112, 1113, and, under open hearth, 1115, 1117 and 1118 only. The 1112 and 1113 are the old 1112 and X1112; and 1115, 1117 and 1118 are the familiar 1115, X1314 and X1315.

The uncertainty of the behavior of bessemer steel for carburizing and hardening would rule out the bessemer series for carburized parts. Bessemer steels are, however, hardened by cyaniding, but as a replacement for alloy steels they would not be recommended.

Of the basic open hearth sulphurized carbon steels there are three steels which could be considered, C1115, C1117 and C1118.

In comparing the sulphurized carbon or for that matter the plain carbon steels with alloy steels, the question of their relative hardenability is a primary consideration.

Except as later noted, sulphurized carbon or plain carbon steels must be water quenched to produce satisfactory hardness. The use of this cooling medium sets up internal stresses which often result in cracking of the parts. Alloy steels can be oil quenched which results in slower cooling rates and, therefore, less internal stress formation and yet produces the same hardness values.

The comparative hardenability of the screw machine steels and alloy and plain carbon in the uncarburized condition is illustrated by Fig. 4.

The test which is best suited to show the differences in hardenability for grades of lower hardenability is obtained by a total quench in water of a 1 in. round about 4 in. long. The specimens are usually normalized at 1650 deg. F. prior to quenching. A quenching temperature of 1650 deg. F. is most likely to produce a uniform hardness. The test would to some extent parallel conditions obtained in the core of a case hardened part.

A comparison between the five steels can be obtained by noting the hardness at a definite cooling rate, for example 135 deg. F. per sec. at 1300 deg. F. which is the cooling rate half way between the center and the outside of a 1-in. round, water quenched.

Steel	Rockwell C, Hardness After Cooling at the Rate of 135 Deg. F. Per Sec. (From Fig. 4.)
A-4620	39
C-1117	34
C-1022	28
C-1118	19
C-1115	18

To promote maximum machinabil-

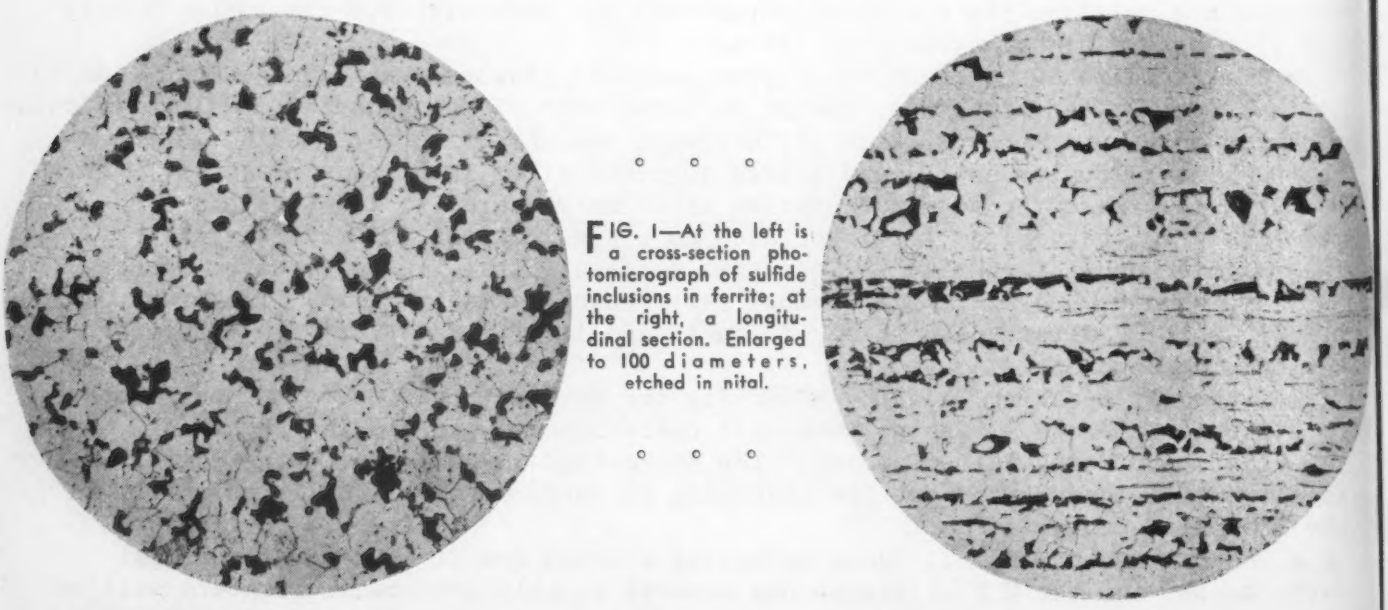


FIG. 1—At the left is a cross-section photomicrograph of sulfide inclusions in ferrite; at the right, a longitudinal section. Enlarged to 100 diameters, etched in nital.

as Alloy Steel Substitutes

By A. S. JAMESON
Works Metallurgist, International Harvester Co.

. . . In this, the first section of a two-part article, the author appraises the possibilities of carburizing grades of screw machine steels in substituting for alloy steels in heat treated parts. Considerable comparative detail is included on hardenability and impact tests.

ity, screw machine steels are usually made with a low silicon content. This is a disadvantage both as far as hardenability is concerned and often as far as soundness of macrostructure is concerned. It would be preferable to insist on a more or less complete degree of deoxidation. The deoxidation should not be obtained by adding aluminum as this will result in the presence of aluminum oxide inclusions which have a very marked effect in reducing tool life because of their abrasive character.

Assuming that aluminum is not used for deoxidation, the steel will normally have a coarse grain size. This characteristic, though advantageous from the point of view of hardenability is a disadvantage for heat treated parts because of the coarse grain structure developed in heat treatment.

These points, as far as they relate to hardenability, are well brought out by Fig. 4. The hardenability of C1115 is well below that of C1022, although it has practically the same amounts of the elements which promote hardness and hardness penetration such as carbon, manganese and chromium, even though C1022 has the disadvantage of being fine grained.

This low hardenability of C1115 is due to its state of incomplete deoxidation as evidenced by its low silicon content.

The C1117 steel has a hardenability greater than that of C1022. This can be accounted for by the higher manganese content and the coarse grain characteristic of C1117.

Reverting to the remarks on low silicon content and deoxidation, when the manganese content is over 1 per cent, a higher silicon is not necessarily a criterion of the degree of deoxidation, for there is sufficient manganese present alone to deoxidize the steel adequately.

The effect of grain size on hardenability is very marked. For the purpose of illustrating this a fine grained C1118 was selected. It will be noted that despite the much higher manganese content of the C1118 steel as compared with the C1117 steel, the hardenability of C1118 as shown by this test is very low, almost as low as that of the coarse grained C1115 steel.

Carburization

Where the steel is in a highly oxidized condition, the rate of carbon penetration is reduced. This fine grain size also shows a reduced speed of carbon penetration. Figs. 5 and 6

FIG. 2—Longitudinal and transverse tensile test results on carbon and sulphur-manganese steels. The heat treatments, indicated by number, are: (1) water quenched at 1450 deg. F.; (2) water quenched at 1600 deg. F.; (3) water quenched at 1650 deg. F., RQ at 1450 deg. F. Analyses of steels used, which were treated in 1/2-in. test bar size, are: (A) carbon steel, containing C 0.20, Mn 0.52, S 0.027, P 0.014, Si 0.21; (B) sulphur-manganese steel, containing C 0.20, Mn 1.18, S 0.100, P 0.016, Si 0.21.

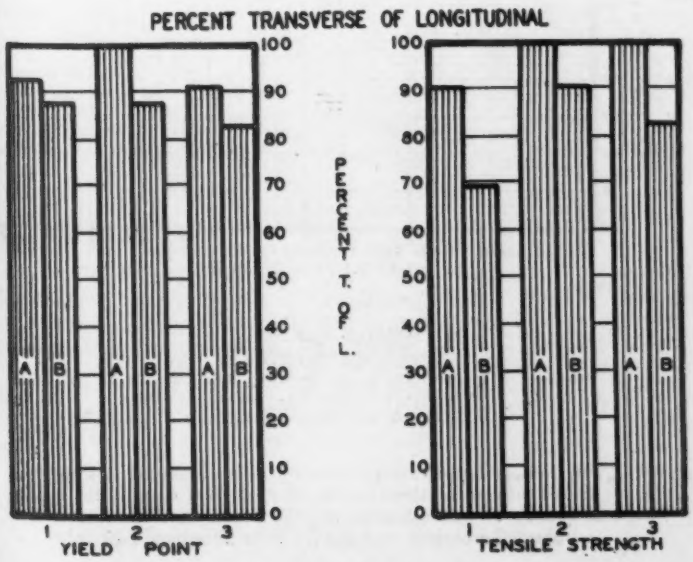
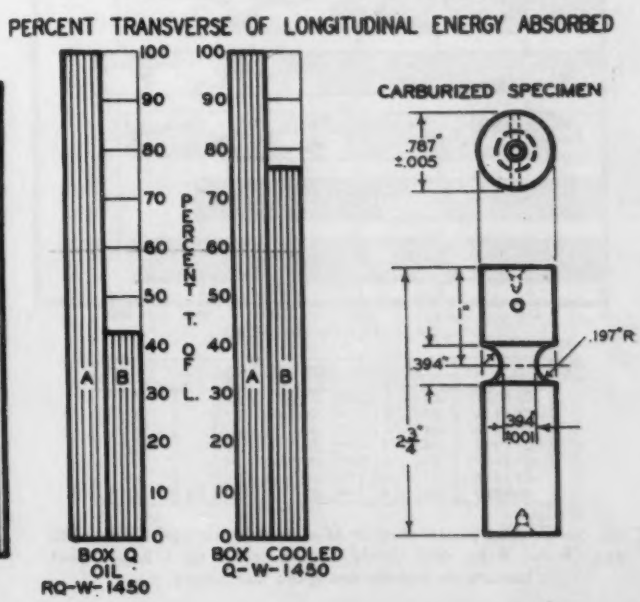
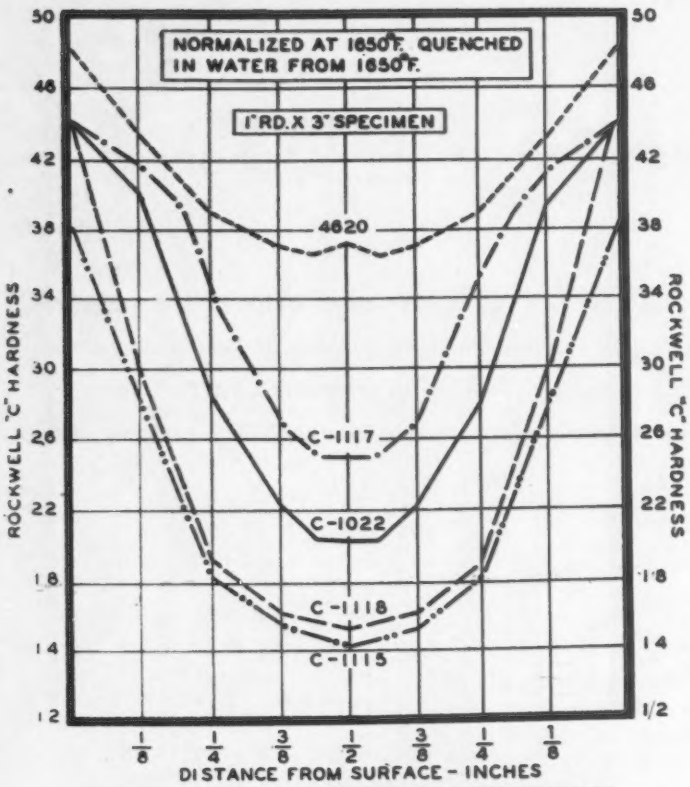


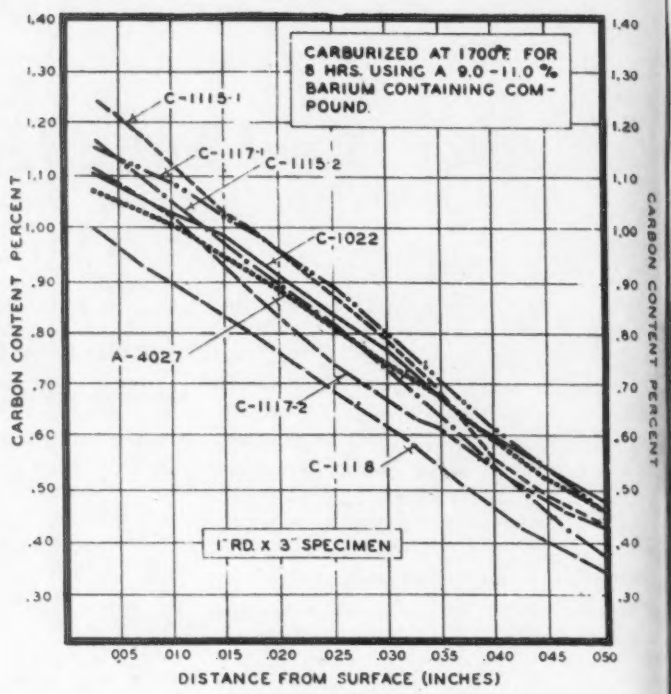
FIG. 3—Longitudinal and transverse impact test results on (A) carbon steel containing C 0.20, Mn 0.52, S 0.027, P 0.014, Si 0.21; and (B) sulphur-manganese steel containing C 0.20, Mn 1.18, S 0.100, P 0.016 and Si 0.21, carburized at 1700 deg. F. for a case depth 0.040 to 0.050 in.





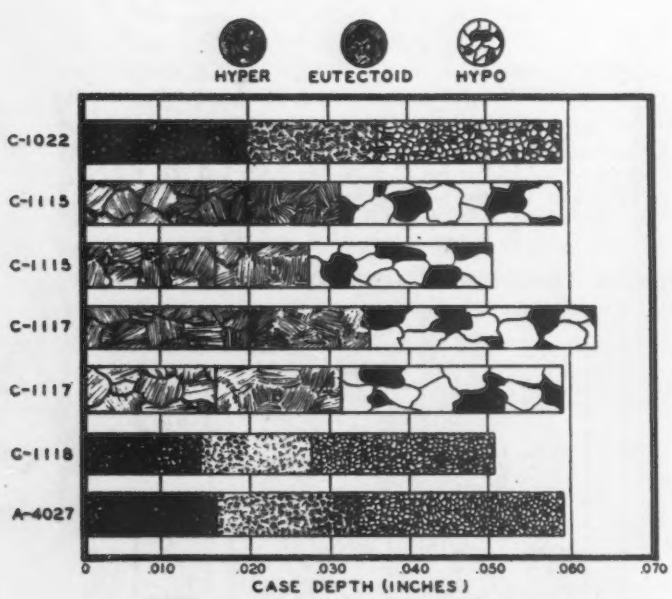
STEEL NO.	CHEMICAL COMPOSITION							A.G.S. AT 1700°F.
	C.	MN.	S.	Si.	CR.	Ni.	MO.	
C-1022	.21	.90	.028	.26	.17	.01		FINE
C-1115	.20	.79	.103	.06	.11	.01		COARSE
C-1117	.20	1.12	.097	.03	.03	.01		COARSE
C-1118	.17	1.37	.173	.05	.02	.04		FINE
A-4620	.19	.58	.012	.25	.17	1.78	.28	FINE

FIG. 4—Hardenability curves for carbon, sulphurized carbon and alloy steels.



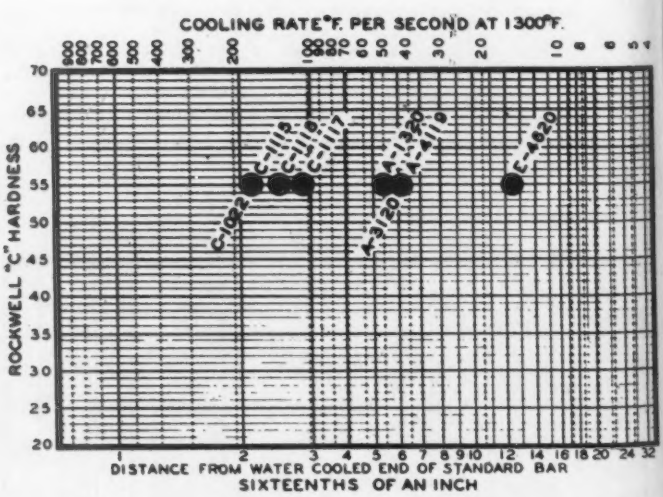
STEEL	CHEMICAL COMPOSITION								A.G.S. AT 1700°F.
	C.	MN	S.	P	Si.	Ni.	CR.	MO	
C-1022	.22	.76	.033	.032	.22	.17	.08		7
C-1115-1	.20	.79	.103	.007	.06	.01	.11		3
C-1115-2	.17	.74	.236	.010	.01	.02			3
C-1117-1	.18	1.03	.088	.007	.01	.17	.06		3
C-1117-2	.20	1.12	.097	.015	.03	.01	.03		3
C-1118	.17	1.37	.173	.018	.05	.14			8
A-4027	.28	.78	.014	.014	.29	.11	.11	.23	8

FIG. 5—Carbon penetration curves for carbon, sulphurized carbon and alloy steels.



STEEL NO.	CHEMICAL COMPOSITION							A.G.S. AT 1700°F.
	C.	MN.	S.	Si.	Ni.	CR.	MO.	
C-1022	.22	.76	.033	.22	.17	.08		7
C-1115	.20	.79	.103	.06	.01	.11		3
C-1115	.17	.74	.236	.01	.02			3
C-1117	.18	1.03	.088	.01	.17	.06		3
C-1117	.20	1.12	.097	.03	.01	.03		3
C-1118	.17	1.37	.173	.05	.14			8
A-4027	.28	.78	.014	.29	.11		.23	8

FIG. 6—Carbon penetration in seven steels, carburized at 1680 deg. F. for 8 hr. and slowly cooled in 90 to 110 per cent barium carbonate energized compound.



STEEL	CHEMICAL COMPOSITION					AGS AT 1700°F.
	MN	S	Si	Ni	CR	
C-1022	.83	.020	.23	.04	.04	FINE
C-1115	.83	.119	.04	.04	.05	COARSE
C-1117	1.12	.115	.05	.04	.03	COARSE
C-1118	1.37	.17	.05	.05	.02	FINE

FIG. 7—Comparative hardenability of low carbon, sulphurized carbon and alloy steels, carburized at 1680 deg. F. for 8 hr. and quenched in oil reheated to 1480 deg. F. and end quenched in water. Carburized end-quench tests based on J-55 value.

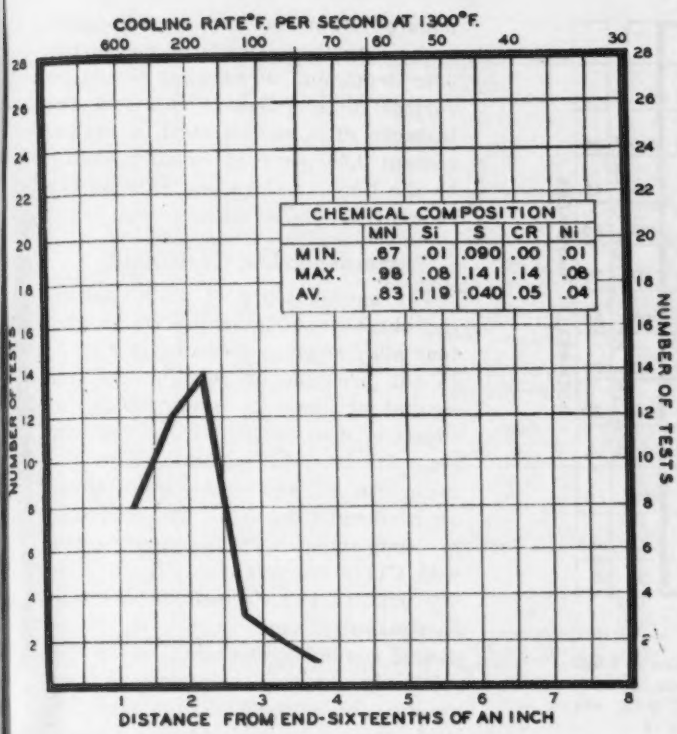

COOLING RATE °F. PER SECOND AT 1300°F.
600 200 100 70 60 50 40 30
CHEMICAL COMPOSITION
MN Si S CR Ni
MIN. .67 .01 .090 .00 .01
MAX. .98 .08 .141 .14 .08
AV. .83 .119 .040 .05 .04
NUMBER OF TESTS
DISTANCE FROM END-SIXTEENTHS OF AN INCH

FIG. 8—Frequency distribution curve for 40 heats of AISI C 1115, coarse grained, carburized at 1700 deg. F. for 8 hr. and quenched in oil, reheated to 1480 deg. F. and end quenched in water.

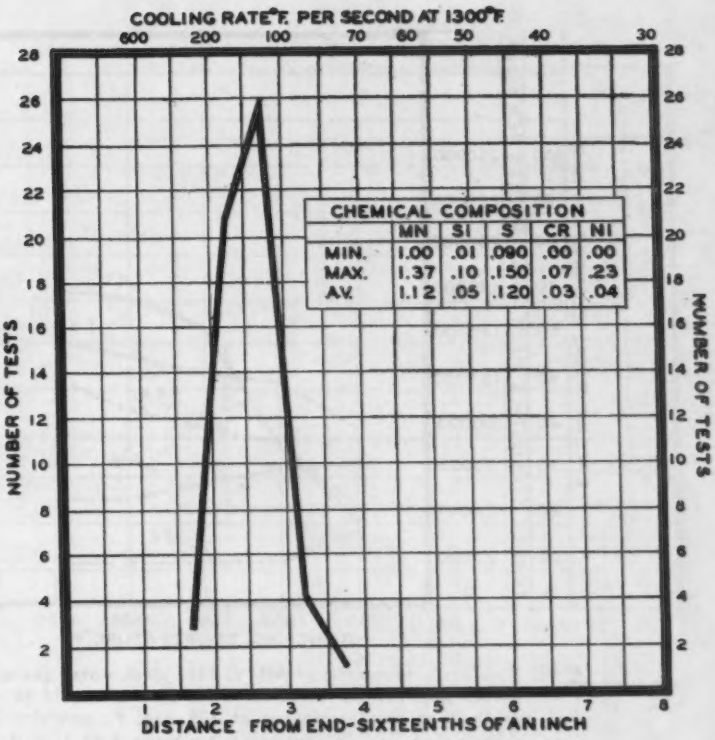

COOLING RATE °F. PER SECOND AT 1300°F.
600 200 100 70 60 50 40 30
CHEMICAL COMPOSITION
MN SI S CR NI
MIN. 1.00 .01 .090 .00 .00
MAX. 1.37 .10 .150 .07 .23
AV. 1.12 .05 .120 .03 .04
NUMBER OF TESTS
DISTANCE FROM END-SIXTEENTHS OF AN INCH

FIG. 9—Frequency distribution curve for 55 heats of AISI C 1117, coarse grained, carburized at 1700 deg. F. for 8 hr. and quenched in oil, reheated to 1480 deg. F. and end quenched in water.

show the carbon penetration obtained by carburizing the screw machine steels C1115, C1117 and C1118 at 1700 deg. F. for 8 hr. and slowly cooling. From these figures, especially Fig. 6, the effect of incomplete deoxidation can be noted. There are two heats of C1115, the second heat contained only 0.01 per cent silicon and the austenitic grain size test (McQuaid-Ehn) showed a slight abnormality in the formation of the carbide network inasmuch as there was some discontinuity of the network. This heat showed a reduced rate of penetration of 0.52 in. in 8 hr. as compared with 0.058 in. for the more normal heat. This is not perhaps of practical importance but is interesting from an experimental view point.

Grain size also has some effect on carbon penetration, comparing C1117 and C1118 in Fig. 6, which shows 0.052 in. for C1118 fine grained and 0.064 in. for C1117 coarse grained, despite the higher manganese content of C1118.

Manganese is known as an element which promotes a more rapid carbon penetration.

In the case of the remarks regarding the effects of deoxidation on the C1115, it is believed that sulphur may have the effect of reducing the rate of carbon penetration. It has been established that sulphur has a slightly depressing effect on the hardenability.

It should not be inferred that the writer is basing his remarks as to the effect of deoxidation, grain size, etc., on hardenability or the rate of carburization on the data given in Figs. 4, 5 and 6, but has merely used these data as a framework for the discussion of his observation over a period of years. The measurements in Fig. 6 were obtained by microscopic examination at 100 diameters after etching in 2 per cent nital.

The hypereutectoid zone when compared with the carbon determination chart (Fig. 5) extends to about 0.85 per cent carbon and the hypereutectoid plus the eutectoid zone to about 0.65 per cent carbon, that is, to the appearance of the first free ferrite. A comparison of the two methods of determining case depth is shown in Table II.

This aside is included because there has always been a lack of agreement

TABLE I
List of Low Carbon Sulphurized AISI Steels

	AISI No.	Chemical Composition Limits, Per Cent							
		Carbon		Manganese		Phosphorus		Sulphur	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Acid Bessemer	B1110	.....	0.13	.....	0.60	.....	0.11	0.045	0.075
	B1111	0.08	0.13	0.60	0.90	0.09	0.13	0.10	0.15
	B1112	0.08	0.13	0.60	0.90	0.09	0.13	0.16	0.23
	B1113	0.08	0.13	0.60	0.90	0.09	0.13	0.24	0.33
Basic Open Hearth	C1109	0.08	0.13	0.60	0.90	.....	0.045	0.08	0.13
	C1110	0.08	0.13	0.60	0.90	.....	0.045	0.10	0.15
	C1112	0.10	0.16	1.00	1.30	.....	0.045	0.08	0.13
	C1113	0.10	0.16	1.00	1.30	.....	0.045	0.24	0.33
	C1115	0.13	0.18	0.70	1.00	.....	0.045	0.10	0.15
	C1116	0.14	0.20	1.10	1.40	.....	0.045	0.16	0.23
	C1117	0.14	0.20	1.00	1.30	.....	0.045	0.08	0.13
	C1118	0.14	0.20	1.30	1.60	.....	0.045	0.08	0.13
	C1120	0.18	0.23	0.60	0.90	.....	0.045	0.08	0.13
	C1121	0.18	0.23	0.70	1.00	.....	0.045	0.08	0.13

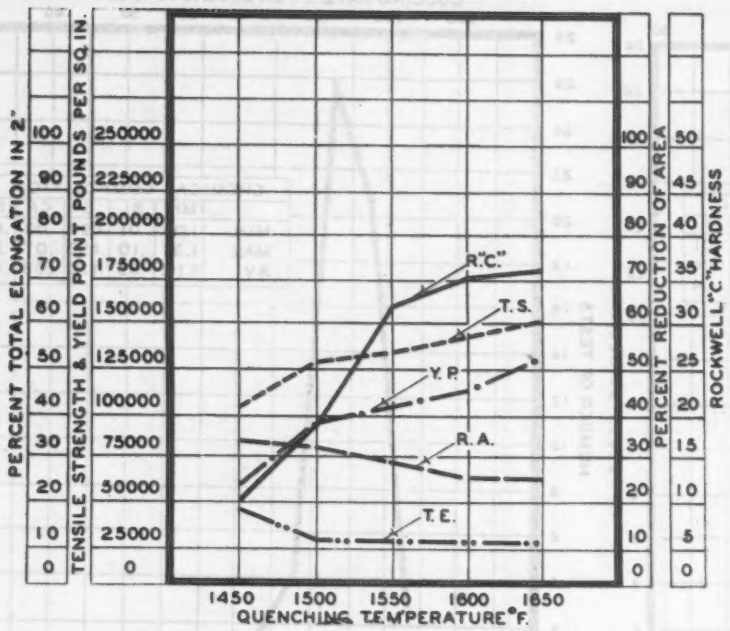


FIG. 10—Tensile properties of AISI C 1115 steel, water quenched in 0.525-in. test bar size; heated to indicated temperatures, held 40 min. at heat and quenched in water tempered at 325 deg. F.; contains C 0.18, Mn 0.86, S 0.14, Si 0.08; austenitic grain size 2 at 1700 deg. F.

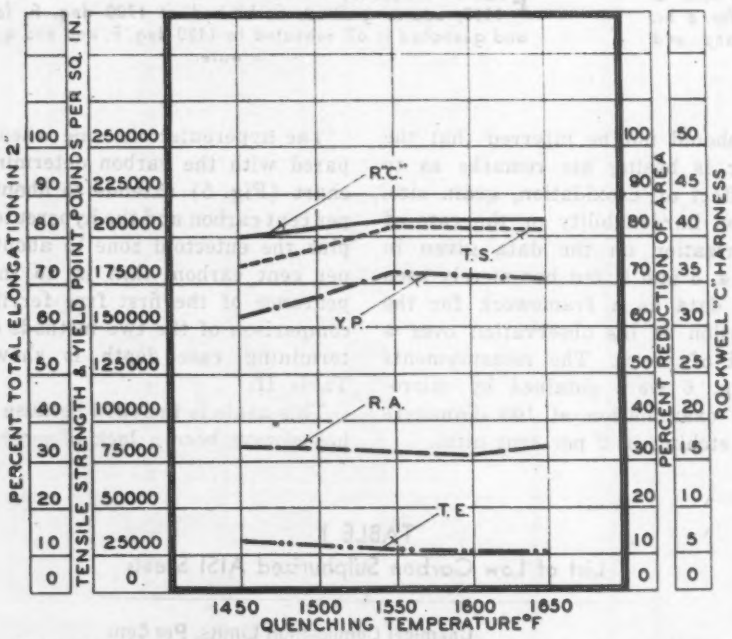


FIG. 11—Tensile properties of AISI C 1117 steel, water quenched in 0.525 in. test bar size; heated to indicated temperatures, held 40 min. at heat and quenched in water; tempered at 325 deg. F.; contains C 0.20, Mn 1.12, S 0.10, Si 0.03; austenitic grain size 3 at 1700 deg. F.

TABLE III
Effect of Temperature on the Hardenability of Carburized Screw Machine Steels

AISI No.	Chemical Composition					Austenitic Grain Size at 1700 Deg. F.	Quenching Temperature, Deg. F.				
	Manganese	Silicon	Sulphur	Chromium	Nickel		1450	1500	1550	1600	1650
C1115	0.79	0.06	0.10	0.11	0.01	3	0.07	0.06	0.06	0.08	0.15
C1117	1.12	0.03	0.10	0.09	0.23	2	0.13	0.16	0.23	0.25	0.45
C1118	1.37	0.05	0.13	0.02	0.14	7	0.14	0.16	0.16	0.16	0.16

among engineers and metallurgists both as to the methods of measuring case depth and as to what should be considered as effective case. In the instance of a carbon steel, a carbon content 0.65 per cent would probably be the limit of the effect case as far as wearing quality is concerned.

Hardenability, Carburized

The hardenability of plain carbon, the three screw machine steels and four alloy steels, are shown in Fig. 7. In the presence of a higher carbon content obtained by carburizing, the effects of deoxidation, silicon content, etc., are not so evident; however, grain size still has an important effect on hardenability. This can be noted by comparing C1117 coarse grain with C1118 fine grain in Fig. 7. The fine grained C1118 steel has a lower hardenability even though its manganese content is higher. Due to the relatively greater variation in the practice of making screw machine steels there is a considerable spread in hardenability.

Figs. 8 and 9 are frequency curves for carburized specimens of C1115 and C1117 steels. The hardenability in the carburized condition of these two steels can be improved by increasing the reheating temperature as shown in Table III. In practice this is, however, out of the question for coarse grained steel because of the greater enlarged grain size encountered and therefore a decreased impact value.

Tensile Properties

Tensile properties of C1115, C1117 and C1118 steels in ½-in. sections will reflect the relative hardenability of these steels for where a condition of "complete hardening" was attained there should be little or no difference in tensile properties, assuming the same carbon content in the steels.

A condition of "complete hardening" would be one in which the complete ½ in. section (outside to center) consisted of uniform martensite. It has been shown by Grossmann and others that there is a certain maximum hardness which can be obtained from a particular carbon content which also means certain maximum tensile strength. For example, at a carbon content of 0.20 per cent this hardness is 49 Rockwell C, which would represent a tensile strength of 240,000 lb. per sq. in. In actual practice in quenching a 0.20 per cent carbon steel in a ½-in. section from 1500 deg. F., the highest average hardness reading is about 42 Rockwell C. This hardness would represent a tensile strength of about

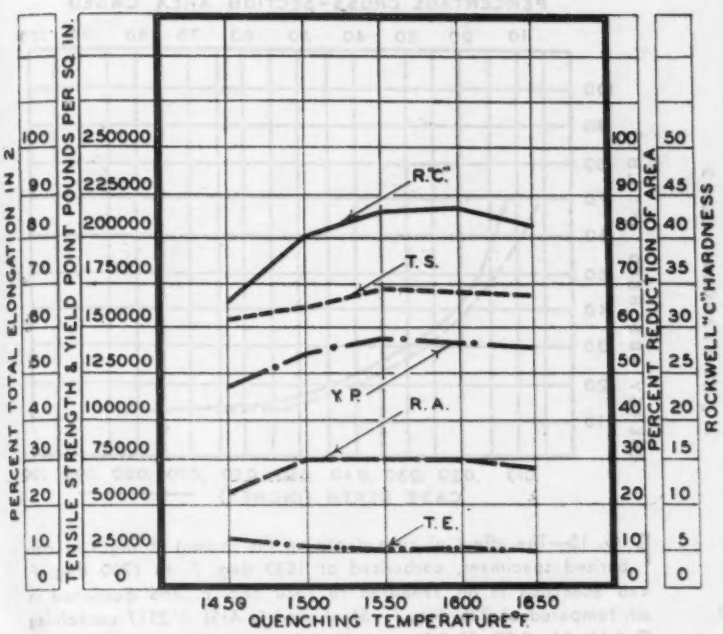
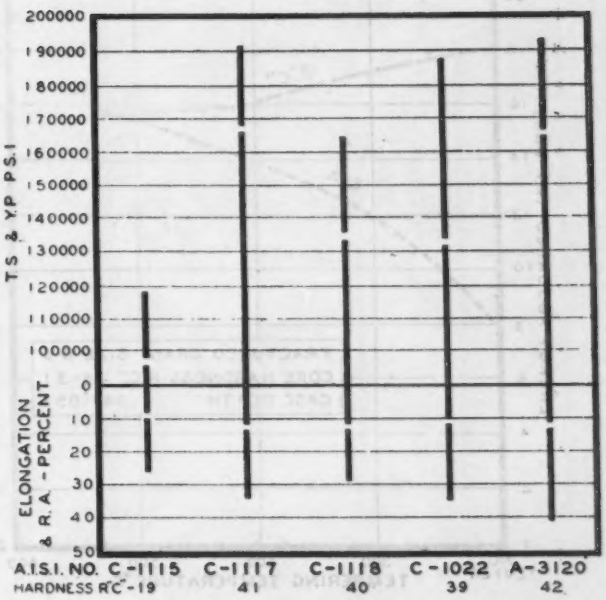


FIG. 12—Tensile properties of AISI C 1118 steel, water quenched in 0.525 in. test bar size; heated to indicated temperatures, held 40 min. at heat and quenched in water tempered at 325 deg. F.; contains C 0.17, Mn 1.37, S 0.17, Si 0.05; austenitic grain size 7 at 1700 deg. F.



STEEL	CHEMICAL COMPOSITION						A.G.S. AT 1700° F.
	C.	MN.	S.	Si.	Ni.	CR.	
C-1115	.18	.86	.141	.08		.01	COARSE
C-1117	.20	1.12	.097	.03		.03	COARSE
C-1118	.17	1.37	.173	.05		.02	FINE
C-1022	.22	.85		.23		.16	FINE
A-3120	.18	.53		.22	1.33	.62	FINE

FIG. 13—Comparative tensile properties of five steels, water quenched from 1500 deg. F. and tempered at 325 deg. F. in 0.525 in. test bars.

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190,000 lb. per sq. in. It will be noted from Fig. 13 that this condition of "complete hardening" is only attained by A3120, C1022 and C1117.

The tensile properties obtained from quenching 0.525 in. test bar sections in water are illustrated in Figs. 10, 11 and 12. They are compared with plain carbon and alloy steel in Fig. 13. The break in the line above the base line is the yield strength and the break in the line below the base line shows the elongation value.

Carburized Impact Tests

The impact test, which is not in general use, consists of carburizing and hardening a specimen of the dimensions shown in Fig. 3, grinding the surfaces and breaking in an impact testing machine. This test has a certain practical value for if parts such as gears are subjected to occasional impact loads they may fail in the same manner as they do in the impact testing machine.

In practice, impact strength can be increased by lowering the hardness of the carburized case. This is illustrated for NE8620 steel in Fig. 14. A reduction in the case depth also increases the values obtained by impact testing (Fig. 15). It is not possible in many instances, however, to take advantage of the increased impact properties of lighter case depth or of lower case hardness due to grinding allowances and wear resistant requirements.

It is difficult to compare steels with widely different characteristics such as C1115 and C1118, or C1115 with an alloy steel. The reason for this is that in an impact test of this type in addition to the variables of case depth and hardness, grain size (fracture) and core hardness have a marked effect.

A fine grained steel will have higher impact values than a coarse grained steel and a lower core hardness will give higher impact values. When these variables are combined to offset one another the results do not appear to be too easy to interpret.

Fig. 16 is a comparison of carbon sulphurized carbon and alloy steel. From this figure certain conclusions can be drawn:

TABLE II

Carburizing Case Depth Measurements by Microscopic Examination and Carbon Determination Chart

Zone	Method of Measurement	Steel Symbol and Depth of Penetration, In.						
		C1022	C1115-1	C1115-2	C1117-1	C1117-2	C1118	A4027
Hypereutectoid	Carbon Determination to 0.85 percent C	0.023	0.026	0.023	0.026	0.019	0.014	0.022
	Microscopic at 100 Diameters	0.020	0.027	0.017	0.021	0.016	0.015	0.017
Hypereutectoid Plus Eutectoid	Carbon Determination to 0.65 percent C	0.037	0.037	0.033	0.038	0.032	0.027	0.036
	Microscopic at 100 Diameter	0.037	0.032	0.028	0.034	0.032	0.028	0.033

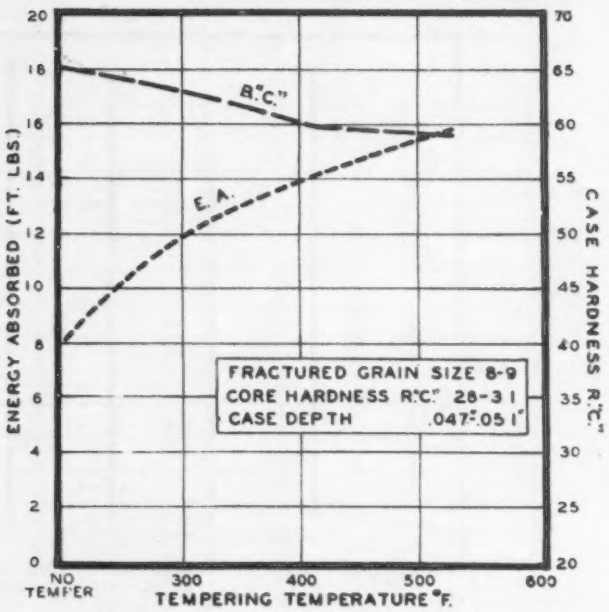


FIG. 14—Effect of case hardness on the impact value of carburized NE 8620 steel (containing C 0.20, Mn 0.81, Si 0.30, Ni 0.58, Cr 0.46, Mo 0.23) carburized at 1700 deg. F. and 8 hr. and quenched in oil reheated to 1525 deg. F., quenched in oil and tempered at the indicated temperatures; austenitic grain size 7 at 1700 deg. F.

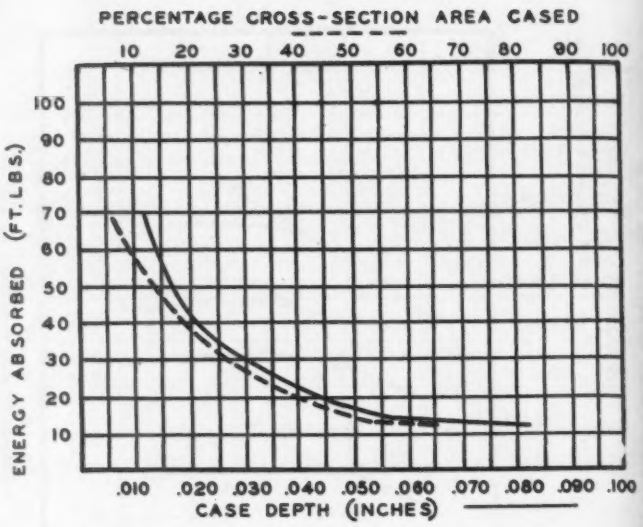
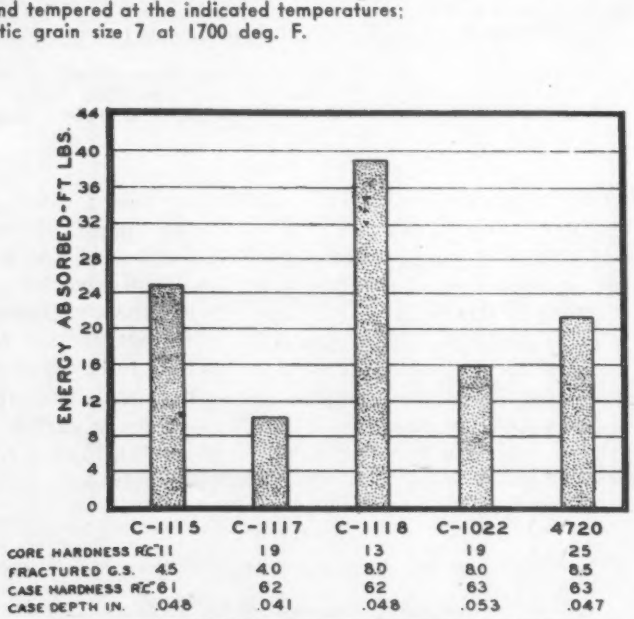


FIG. 15—The effect of case depth on the impact strength of carburized specimens, carburized at 1680 deg. F. to 1700 deg. F. and quenched in oil, reheated to 1520 deg. F. and quenched in oil, tempered at 325 deg. F. Steel used is AISI A 2317 containing C 0.16, Mn 0.55, Si 0.21 and Ni 3.42; austenitic grain size 6 at 1700 deg. F.



	C-1115	C-1117	C-1118	C-1022	4720
CORE HARDNESS R"C"	11	19	13	19	25
FRACTURED G.S.	4.5	4.0	8.0	8.0	8.5
CASE HARDNESS R"C"	61	62	62	63	63
CASE DEPTH IN.	.048	.041	.048	.053	.047

FIG. 16—Comparative impact values of five carbon, sulphurized carbon and alloy steels, carburized at 1700 deg. F. and quenched in oil, reheated to 1500 deg. F and quenched in water, except for 4720 which was oil quenched.

STEEL	CHEMICAL COMPOSITION							A.G.S. AT 1700°F.
	C.	MN.	S.	Si.	Ni.	CR	MO.	
C-1115	.14	.83	.103	.01				3
C-1117	.20	1.12	.097	.03				3
C-1118	.17	1.31	.170	.05				7
C-1022	.21	.90	.028	.26	.01	.17		7
4720	.22	.56	.011	.28	1.09	.41	.22	7

The values for coarse grained C1117 steel are very low.

The values for C1115 coarse grained steel are higher than those for C1117. This can be explained by the fact that the core hardness of the C1115 is much lower.

The values for C1118 are higher than for C1115 and C1117. This can be accounted for by the marked difference in fractured grain size of the case.

In conclusion, it can be stated that the best possibilities lie in the use of C1118 as a substitute for an alloy steel. This steel, made with a fine grain size although not possessing the free machining qualities of a coarse grained C1117 steel and when on the low side of the analysis range not having as high a hardenability value, produces a tougher carburized and hardened part. It also has better machining properties than a carbon steel and in smaller diameters, 3/16 in. and under, it can be satisfactorily oil quenched to over 60 Rockwell C hardness.

If it should be decided that impact strength is not an important consideration, a coarse grained C1118 will have hardenability comparable with some of the lower hardenability alloy steels such as the molybdenum series, which means that oil hardening can be employed up to a ⅝-in. section.

Editor's Note: In the next and final installment of this two-part article, appearing next week, the author appraises the possibilities of medium carbon screw machine steels as substitutes for alloy steels for heat treated parts.

What Executives Should Know About

Purchasing Control

. . . Careful control of purchasing, always important, is now vital if maximum production is to be reached. The method outlined herein by the author enables the purchasing department to keep, without furbelows, quick and accurate tabs on all items and to concentrate expediting energy where it is needed.

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By EUGENE CALDWELL
Consulting Management Engineer, Portland, Oregon

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DURING the present emergency purchasing of materials and supplies has assumed great importance among the various business functions. Almost every firm, regardless of size, has one or more expediters in order to speed up the flow of materials into the plant. But the coordination of the receipt of materials and the records necessary to determine the status of any production at any desired time are phases of the purchasing problem often neglected.

Even in normal periods the control of purchasing is highly desirable. The ultimate goal to work toward in purchasing control is to have all items in the plant the day needed for production and not a day sooner; items not needed for some time should not be on hand (if perfect control were possible).

If perfect control were attainable, the minimum working capital would be needed, minimum warehouse space required, minimum insurance on inventory necessary, and minimum clerical effort needed to check and keep track of surplus stock. But perfect control over purchasing is not possible even in normal times, and the temptation in the present emergency is to take in all the materials available because of the fear they cannot be obtained when needed.

But some sort of purchasing control is highly desirable even under present conditions. Where one product only is being produced and the materials and parts necessary are few, purchasing control is relatively simple. But as the products increase in number and special design, and where the parts involved are many, the control of purchasing becomes very complex.

See "Production Control—How to Keep Delivery Promises," by Mr. Caldwell, THE IRON AGE, April 18 and 25, 1940.

Items are often neglected and their delay and absence is not discovered until the production order is ready to assemble. Many times nothing could be done about the recalcitrant item anyway, but there is no excuse for not having proper records which will bring the item to prominence as soon as it is known that it will not be on schedule.

There are various types of production boards on the market designed to chart complicated production control problems and purchasing control problems. These boards have numerous holes punched in them into which pegs with various numbers, letters, or colors can be inserted. The holes are in columns representing days, weeks, months or other period into which the production may be divided. The pins may be attached to strings or tape which rolls up by spring action, is equivalent to drawing a line on the chart.

After investigating numerous installations of these boards it has been difficult for the writer to find a case where a simple Gantt chart drawn on a sheet of paper printed up for the particular application would not serve the purpose much better. It appears that many installations of such boards have been made because they are somewhat spectacular in appearance, intriguing the user.

The biggest objection to these boards in the opinion of the writer is the room they take up. Wall space in considerable volume must be supplied or cumbersome cases or revolving stands. Moreover the clerk who keeps the information up-to-date must stand up all day. As many boards must be supplied as there are production orders in process in the plant at any one time. If these production orders in process at one time run to 200, then the installation cost of the system can easily run to $20,000, and of course boards with horizontal lines equal to the maximum number of parts on one production order must be provided.

Contrasted to this, charts drawn on paper (a separate sheet for each production order) can be filed in a folder or loose leaf book, requiring almost negligible space. They can be worked on at a desk.

One of the advantages claimed for the production boards is that they can be changed easily to accommodate situations that do not come out as planned. This advantage is fairly equal, in the writer's opinion, to the

ability to change the chart on paper easily, particularly if it is kept in pencil. Moreover the ease with which the information on the production board can be erased is one of the method's disadvantages; that is, the record cannot be preserved after the production order is completed. After the order's completion, the board must be taken down so it can be used for a new production order just starting. This is in contrast to charts on paper, which can be preserved indefinitely.

The first thing to do in designing a Gantt chart form is to determine some time standards for the ordinary order. To do this, a representative group of production orders that have gone through the shop and are now complete should be analyzed for the average time lapse between the release of engineering information on the orders and the time when all of the materials are in the shop ready to proceed with production. Then this standard or average time should be broken up into the various stages or mile posts to be watched as the order progresses. The standard time is something to shoot at, and to use in comparing what actually

happens on each order with what *should* happen if the production order is to go into the shop as first planned.

For example, suppose a fair average time from the day the engineering department releases information to the day all materials for that order arrive in the shop, is four months. Also suppose an analysis of past orders indicates all purchase orders should be placed within three days, all orders acknowledged 10 days after that, delivery promised 10 days after that, patterns completed 14 days later, items entered in foundry seven days later, castings completed 21 days later, all raw materials in the shop three months after the original date, and all purchased parts (such as antifriction bearings) in the plant four months after the original date. These dates, of course, are only examples and have to be adjusted as the average case works out. Also there are probably other events or dates to be watched in the progress of securing the materials.

It is suggested that a chart be printed up to fit the individual plant's case, to be fastened to the bill of material for the particular production order.

A vertical line is provided on the chart for each day; for example, if four months is correct, there will be 120 vertical lines. Three vertical lines from the beginning, there should be printed a heavy line indicating the date orders should be placed. If the example above represented the average order, the forms would all be printed with heavy lines at the third, thirteenth, twenty-third, thirty-seventh, forty-fourth, sixty-fifth, ninetieth, and one hundred and twentieth days. The actual dates would be left blank on the printed charts, to be filled in by pen or pencil when the engineering information is released (date the chart starts).

The chart illustrated herewith is a suggested example. The solid black lines indicate ones that are printed, and the shaded lines (with Benday screen) indicate those filled in, perhaps in pencil, for the particular production order involved. This chart is really a Gantt chart, developed by an industrial engineer, Henry L. Gantt, during the first World War.

As each of the items on the production order, represented by horizontal lines, arrives at the status called for by one of the heavy vertical lines, a horizontal pencil line is drawn across to the vertical line, regardless of whether the event actually took place on that date. Actual dates when the events took place are shown on the chart by various code symbols. For example the acknowledgment of the order might actually have been received on the twelfth whereas the heavy black vertical line is at the ninth. Consequently in the example given, the horizontal pencil line will be drawn to the heavy black printed vertical line at the ninth and the symbol for acknowledgment received is shown at the twelfth, three days later than planned. In other words, at the *actual* time the milepost is reached, a line is drawn across the chart to the date when it *should* have been reached. No line is drawn until the actual event has taken place. The length of these horizontal pencil lines shows instantly the status of each item on the production order, and the shorter the line, the less it has progressed, indicating the necessity of pushing the short-line items.

The charts should be printed in light green ink so that the printing will be subordinated to the pencil or ink marks placed on it. Also the horizontal lines should be exactly three lines to the inch or six lines to the inch depending upon whether single or double spacing is used in typing the bills of material lists, which are intended to be pasted on the left hand margin of the chart.

As purchase orders are placed, the purchase order number should be recorded in the column provided. If placing the purchase order has been held up, the reason should be shown in code in the column, "Delays."

For expediting the orders, a tickler or call-up file should be established. This file has a folder for each day of the month and each month of the year. Each morning the clerk pulls out the folder for that day and delivers its papers to the desks involved.

As purchase orders are issued, the expediting copy of the order should be placed in the tickler file for 10 days in advance. All acknowledgments of the orders are accumulated until the expediting copies appear on the desk for checking. Those that are not acknowledged by that time are followed up and placed in the tickler file for five days more.

Those that have been acknowledged and for which a satisfactory shipping date has been given are sent to the production order file. Those that have unsatisfactory shipping dates are placed in a red, or danger, folder. These are the orders the expediter works on, his file uncluttered with orders that are progressing satisfactorily. If information is received that a previous shipping promise is not going to be kept, the expediting copy must be replaced in the red folder.

If desired, a list of production orders that are going to be delayed from the original scheduled date, if the unsatisfactory shipping date of some parts is not bettered, can be typed weekly from the orders in the red folder. Similarly, a list of production orders can be typed weekly, showing those on which all materials have been received, as well as an accompanying list of production orders on which all promised delivery dates of parts are now satisfactory for present assembly schedule. This information, of course, would be obtained from the Gantt charts.

This purchasing scheduling ties in definitely with the charting and loading programs for the production control department, and a 100 per cent job of purchasing control cannot be accomplished until it is known whether machine tool capacity is going to be available when the raw materials arrive.

An investigation of purchasing operations usually discloses that the matter of inventory control should be looked into. That is to say, items sufficiently popular should not be purchased for each production order but should be bought in larger quantities, taking into account discounts, economical manufacturing quantities, protection against obsolescence, etc. Almost every purchasing agent collects a few items from a number of production orders and purchases them all together, but usually this is only on productions coming through at about the same time.

See "What the Executive Should Know About Inventory Control" by Mr. Caldwell, THE IRON AGE, *Aug. 11 and 18, 1938, and "How Cost Accounting Increases Profits," also by Mr. Caldwell,* THE IRON AGE, *June 27, 1940*

° ° °

Put Carbide Applications

By K. R. BEARDSLEE

Vice-President in Charge of Sales, Carboloy Co., Inc.

TEN years ago a survey* of industry showed that at that time about 2 per cent of all machining operations were being performed with cemented carbides. Today carbide tools are being used for approximately half of all metal machined by U. S. industry, and the percentage is still increasing.

This development has not only meant a revolution in tooling practice but has also had an important effect on the amount of attention to be paid by management to the subject of "tooling" in general. Just as war production requirements are converting our thousands of small plants to precision shops—using highly accurate gages for virtually the first time—so the introduction on a mass scale of carbide tools has brought with it new problems from the standpoint of tool supervision and application.

Perhaps the most important single problem has been the necessity of providing the specialized knowledge needed to facilitate the adaption of carbide tools to specific manufacturing problems and facilities in any given plant. The necessity lies in the nature of carbide tools themselves. While there is no particular mystery with respect to such tools, anyone who has had considerable experience with them can recite offhand many instances where carbide tools have apparently failed or have given but mediocre results—not because of the tools themselves but because of insufficient experience on the part of the man responsible for the tool and the job it was supposed to do.

The mere decision by management to use carbide tools will not necessarily result in vastly increasing plant output. The ultimate in economy output and quality of product can be achieved only if the design and selection of carbide tools, their application and care, etc., are the direct responsibility of personnel who know not only what to do but also what not to do. Industry has had to *unlearn* more about what it thought it knew about tools in general than it has had to learn about carbides.

*A.S.M.E. Report of Sub-Committee on Metal Cutting Dec. 7, 1933.

Specialists Needed

Today there are hundreds of real "carbide men" in industry, but hundreds—if not thousands—of plants are still handicapped by shortage of the necessary carbide-experienced supervisory personnel.

The manner in which this problem has been solved by industrial organizations has taken many forms. Much of it has depended on the individual plant—its size, the nature of its products and the organization of its manufacturing supervisory personnel.

In general, of course, the responsibility for providing the necessary carbide-experience in any given plant rests with the tool supervisor or his equivalent. In many cases the practice followed has been for the tool supervisor to secure a carbide-trained specialist or have one or more of his men trained to know carbides. In some of the larger plants, the carbide man is actually a whole department—taking complete responsibility for the fabrication, selection, application and maintenance of carbide tools.

While the usual practice is to put carbide men under the direction of the tool supervisor, there have been some cases where management has set the carbide man up as an independent specialist in the plant. In such a capacity he works hand in hand with the tool supervisor, taking the complete responsibility for carbides and thus relieving the tool supervisor of the detail work incident to carrying out an effective carbide tooling program. This type of arrangement seems to be favored by industrial organizations where completely new tooling of a plant is involved.

The "Carbide Man's" Jobs

Irrespective of the organizational setup, however, the relative success of a carbide tooling program depends to a large extent on the capabilities of the individual or individuals to whom is assigned the responsibility of seeing it through. The carbide man must be able to take responsibility not only as to the design and maintenance of carbide tools but also as to their use in his plant. He should not only be able to supervise grinding and manufacture of such tools in his plant but also act as a consultant for foremen and for set-up men in applying tools to a job.

He will be found working with tool design departments, with time study and methods departments. He is able to take on the job of training factory manpower in the design, brazing, operation and grinding of carbide tools. He can instruct foremen and assistant foremen as to the principles involved in the use of carbide tools—what to do, and what not to do. He helps establish correct speeds, feeds, depths of cut — and therefore production schedules—on carbide tooled machines.

Even the requisitioning of carbide tools may come under your carbide man, when it also becomes his responsibility to see that adequate but not superfluous stocks of carbide tools and tips are carried. Here specialized carbide training and experience becomes particularly valuable to the tool supervisor. His carbide man generally has made it his business to know what is available in the way of mass produced standard carbide tools, blanks, etc.—and how and to what extent these will fit his own plant's tooling requirements. Thus he can not only get tools on the job faster but he is able to reduce tool cost and tool inventories to the practical minimum. Experience has demonstrated time and again the advantage of concentrating or coordinating these responsibilities in a single individual.

To many a plant tool supervisor the addition of an effectively functioning carbide man or carbide department has brought a new and more important relationship to his own management, giving tool supervision a "posi-

In Hands of Specialist . . .

. . . Most effective use of carbide tools can be obtained if the tool supervisor has on his staff a man who is thoroughly familiar with such applications. The selection and training of such a "carbide man" is discussed by the author.

tion of authority" highly useful in turn to the carbide man in his varied activities—not only as to the tools themselves but also as to the training of plant manpower with regard to carbides.

A carbide man, it should be understood, need not be in a position to dictate arbitrarily as to the use of carbide tools. The right kind of a man does his job best by practical demonstration of the fact that he knows what he is doing. If he knows where and how carbide tools can help it is his job to sell that idea.

Plant Tool Standards

A good carbide man can go far today in helping to make his plant self-sufficient as to complete cutting tools. One step in this direction is in the setting up of a line of plant tool standards. In the average plant, a relatively small number of sizes and types of carbide tools will cover nearly three-quarters of the plant's requirements. Most of these usually will be found to fall within the range of carbide tool suppliers' standard tools. Minor modifications of these standard tools —usually quickly obtained by grinding standard to special shapes—account for perhaps another 15 per cent.

In setting up plant standards the carbide man can follow several procedures. The decision as to which is most suitable will depend on a study of his own plant's requirements. Frequently the final result is a combination of the following:

1. Plant standard tools selected from the mass-produced standard tools readily available from carbide tool manufacturers and suitable for use "as is." Here stock tools are fitted to as many jobs as possible.
2. Plant standard tools produced simply by regrinding special shapes from standard carbide shanks and blanks.
3. The small balance of special tools which cannot be secured by grinding standard tools to special shapes can be either obtained from the carbide tool manufacturer or the tool producers furnishing special tools tipped with carbides. Many also can be produced in the plant —again using standard tips from stock wherever possible to reduce cost and speed delivery.

Brazing of carbide tips to tools presents no difficulty in the average plant. The provision of simple torch brazing equipment is about the only additional item required. The preliminary milling of a recess in the steel shank to accommodate the carbide tip is a simple operation that can be done on the milling equipment usually readily available in the average plant tool room, while grinding equipment has to be provided anyway to take care of tool maintenance.

Surprisingly enough the job of finding a man capable of these varied duties is not as difficult as it sounds. There usually is in any plant, some man with broad shop experience who has the necessary initiative and personal characteristics to become an effective carbide man. In many plants someone on the tool supervisor's staff has the desired qualifications. Good material for a carbide man also may be found among the experienced set-up men or foremen or their assistants. Tool supervisors usually know where they can lay their hands on a man with the necessary qualifications.

A point to remember is that it isn't necessary that a carbide man have a great deal of past experience with carbides to start. Far more important is that he be able to get along with people. He should be a natural leader and able to command the respect of the people with whom and for whom he is working. His ability to exercise the necessary authority to carry out a sound program will depend largely on that one factor. He should have an analytical type of mind, but a mind which is open to suggestions no matter from where they come—from inside the plant or from without. He should be willing to try anything reasonable once, and enter his new job without preconceived ideas.

In the final analysis, a carbide man will learn more from actually working at his job than he can any other way. The main thing, it has been found, is to supply such a man with a thorough grounding in the fundamentals of carbide tools.

To help industry from this standpoint, there was organized about three years ago at the Carboloy plant a one-week training course for carbide men. It is not an elementary course since previous shop experience is a requisite, but it is predicated on the theory that the average man selected may have either little or no knowledge with regard to carbide tools. The course is also designed to act as a "refresher" for the man who has had experience with carbide tool practice.

Men from plants using carbides attending this course frequently find that such minor things, for example, as a slight change in the dressing of grinding wheels, or the method of applying the torch when brazing tips, solve heretofore mystifying problems of poor carbide tool performance. Such things might seem to be relatively minor but they can spell the difference as to whether a carbide program in a given plant will be thoroughly successful or not. From this standpoint, it should be pointed out that, in general, *ideal* high speed tool practice is good carbide tool practice, and vice versa but that many of the things you can "get away with" with high speed steel tools will reduce the efficiency or even cause the failure of a carbide tool. The Carboloy course is therefore more of an insurance course against doing the wrong thing than anything else.

In one week a good shop man can acquire all the fundamentals he will have to keep in mind. For a proper appreciation of *both* the limitations and advantages of carbides, he will have learned how carbides are produced; the basic fundamentals of correct carbide tool design, including requirements as to tool posts and holders, permissible overhang, use of shims, determination of speeds and feeds, use of coolants, etc.; brazing of various types of tools; theory and practice of correct grinding for carbide tools; the fundamentals of chip breakers—frequently vital in cutting steels with carbides—and determination of tool style and size, grade of carbide, tip proportions and tool shape and angles. Close to 1000 men have already been trained in this school.

As a further aid, a series of six silent slide films have been developed for training purposes. These are strictly non-commercial and available not only to trainees at the school but also to industry in general. They are designed to be useful tools for the carbide man himself in training men in his own plant on his return. Several hundred of these films are already in use in war industries.

Putting the Man to Work

Among the most successful plans of operation in putting a carbide man to work after his training period is that of giving him a rather free hand for a while. Usually he is encouraged to pick out a few simple applications and put carbide tools to work on them —preferably using the readily available strictly standard tools. At the outset he often takes care of tool grinding, any necessary brazing, etc., himself. He starts keeping records of feeds, speeds and tool life on operations to which carbide tools have been applied, supervising the setting up of the operation.

Incidentally, it is important to see to it that he has the proper type of grinding equipment available. The usual practice is for the tool supervisor to check into this factor immediately the decision is reached to initiate a carbide program.

As the carbide man becomes better grounded, he starts analyzing operations to which strictly standard tools can be applied with only minor alterations. Here he gains the necessary experience to enable him to work with the tool design department, on the more specialized types of carbide tools which might be required to round out a complete program.

Such a procedure also gives the man time to train other men in his own plant, including grinders, set-up men and foremen, without delaying the inception of the program. It may seem to take a little bit longer to do it this way, but in the final analysis it usually proves to have been the shortest road toward the modernizing of a plant's tool program.

From this standpoint, it should be remembered that conversion to carbides is not a war expedient. Carbides have proved their economic value too definitely for this. Conversion to carbides means not only increased production per man hour and machine hour at a lower cost today, but it will mean this just as much after the war, when competitively the use or non-use of carbides can easily spell the difference between profitable or non-profitable operation.

Leaf Spring Landing Gear Accepted

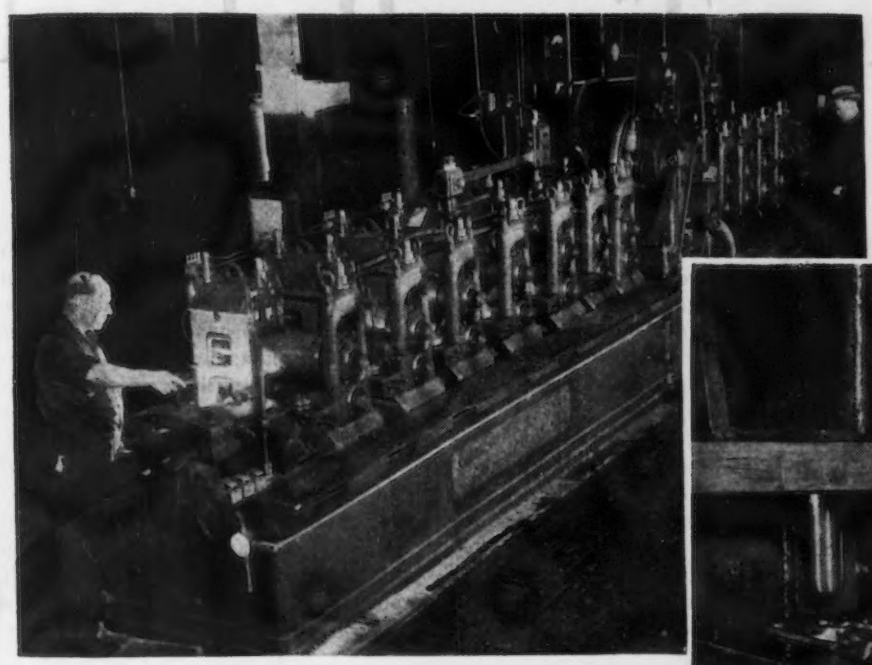
THAT popular priced airplane for everybody may be brought considerably nearer by a new type of leaf spring landing gear which has been drop-tested, flight-tested, and approved by the Army Air Forces Materiel Center at Wright Field for use on PT-12 and PT-17 training planes. Made from flat, non-critical steel plate stock cut to shape, drilled and bent to form, it is cheaper and simpler to construct than the present strut and saves many hours of production time. Leaf spring tail sprags are already in general use on many small airplanes.

While it might be thought that the absence of recoil snubbers would cause a plane using this new type of landing gear to bounce right up into the sky, upon being landed, quite the reverse is true. When the wheels hit the ground, the spring landing gear spreads out and the sidewise motion of the tires upon the ground absorbs the recoil.

Wright Field test pilots claim that this spring gear is superior in every way to the landing gear currently used on planes of this type. It is softer in taxiing and less stiff when the plane dropped in for a hard landing. There is no rebound tendency when the plane is landed on hard, dry surfaces and, even when landings are made on wet grass or ice, the rebound is negligible. In take-offs, there is no apparent difference from the conventional gear installations.

Intake Pipes Formed From Strip

When the supply of seamless tubing required for the manufacture of intake pipes for Pratt & Whitney aircraft engines became short, Buick Motor Division solved the problem by the unique conversion of automotive equipment. The pictures on this page describe the major steps in the process utilized by Buick.



THIS American Electric Fusion Corp. resistance welding tube mill was formerly used to produce torque tubes for Buick automobiles. Fully automatic, it forms, welds, scarfs, sizes, straightens and cuts to length in one pass. To produce aircraft tubing, the machine is fed with coiled SAE 1010 fender stock of about 0.032 in. thickness.

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AFTER being formed and cut to size, flanged at one end and normalized, the straight tubing is taken to a standard type tube bending machine. The machine wraps the pipe section around a central die to form a right angle bend. During this operation the shape of the tube is only slightly distorted. Each Pratt & Whitney engine requires 14 right-angled intake pipes.

TO restore perfect concentricity of the tube, it is ball sized in this hydraulic press. After the tube is locked in a split holding die a ram forces a sizing ball and six chaser balls of bearing steel down through the tube. The travel of these balls brings the tube to shape. This illustration shows the jaws of the die opened and the piece, still in place, being gaged.

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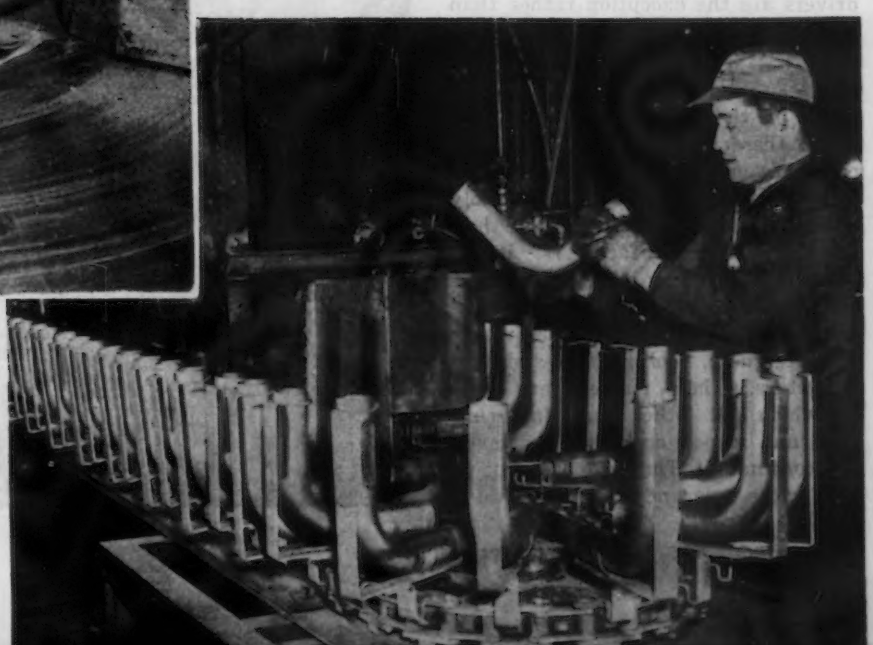


THE pipes are moved on conveyor to a sand blasting station where 100 grain shot is employed for cleaning, both inside and out. Some surface strengthening is achieved by this shot blasting, although the prime objective is to remove grease and dirt. Subsequently the pipes are painted with a yellow primer and a black enamel finish before being shipped to engine assembly points.

Inspection Time Reduced

TOOLING improvements which have lightened the load of production inspection began with the boom of the aircraft industry prior to the war. Today at Vultee Field these improvements are still going on, meeting the double-barreled problem of an influx of decreasing skilled help on one hand, and on the other, constantly increasing production schedules which cut down the time that can be allotted for the inspection of parts or assemblies.

Two broad tooling phases have helped answer these problems. One was to produce tools for the fabrication of parts to such exactness that inspection of parts before assembly was practically made unnecessary. The other was to provide production inspection with the necessary tools to simplify elaborate and lengthy inspection procedures into a few simple mechanical checks and thus minimize the need of highly skilled production inspection personnel.

Of the first phase an excellent example is the B-24 Liberator nacelle assembly line, Fig. 1, where parts fabricated in other sections of the plant change the huge bomber's power plant from a bare motor mount to a complete nacelle ready to be installed on a plane and flown away. So completely interchangeable are the parts of this assembly and so accurately have they been made that along the entire length of the assembly line, tools other than wrenches and screwdrivers are the exception rather than standard practice.

Use of Masters

All of the fabrication tools from which these parts are made stem directly from master tools, a system which Vultee Field Division probably has utilized more extensively than other aircraft manufacturers. Building of these tooling masters is an exacting job requiring highly skilled work on the part of tool engineers, tool designers, tool makers and tool inspectors. These masters are tools to which all other manufacturing tools and inspection gages are made or coordinated. They are laid out to very close tolerances and machined with great care; they are never used to manufacture parts, but are kept under lock and key to be used only by tool inspectors for checking other tools at Vultee Field.

The masters are made directly from loft layout and engineering drawings. This means much more accurate work. The masters are manufactured to much closer tolerances than called for by the engineering drawings, much as gage tolerances are much closer than part tolerances. As an example, engineering drawings would give a tolerance of plus or minus 0.010 in. but the tooling master is held to plus or minus 0.002 in. This exactness on the master when transferred to the production tools results in perfect parts and complete interchangeability, with consequent ease of assembly operations as exemplified by the B-24 Liberator nacelle assembly line, on which there is no essential jig or fixture.

In building these master tools all contours are matched to a mock-up of the assembly taken from the loft reproductions. Hole patterns are taken directly from the loft, then

FIG. 1—View of two of the four B-24 nacelle assembly lines at the Consolidated Vultee plant at Vultee Field. By assuring production of interchangeable parts, few tools other than wrenches and screwdrivers are needed to put these covering pieces over the engines.

on Aircraft Parts

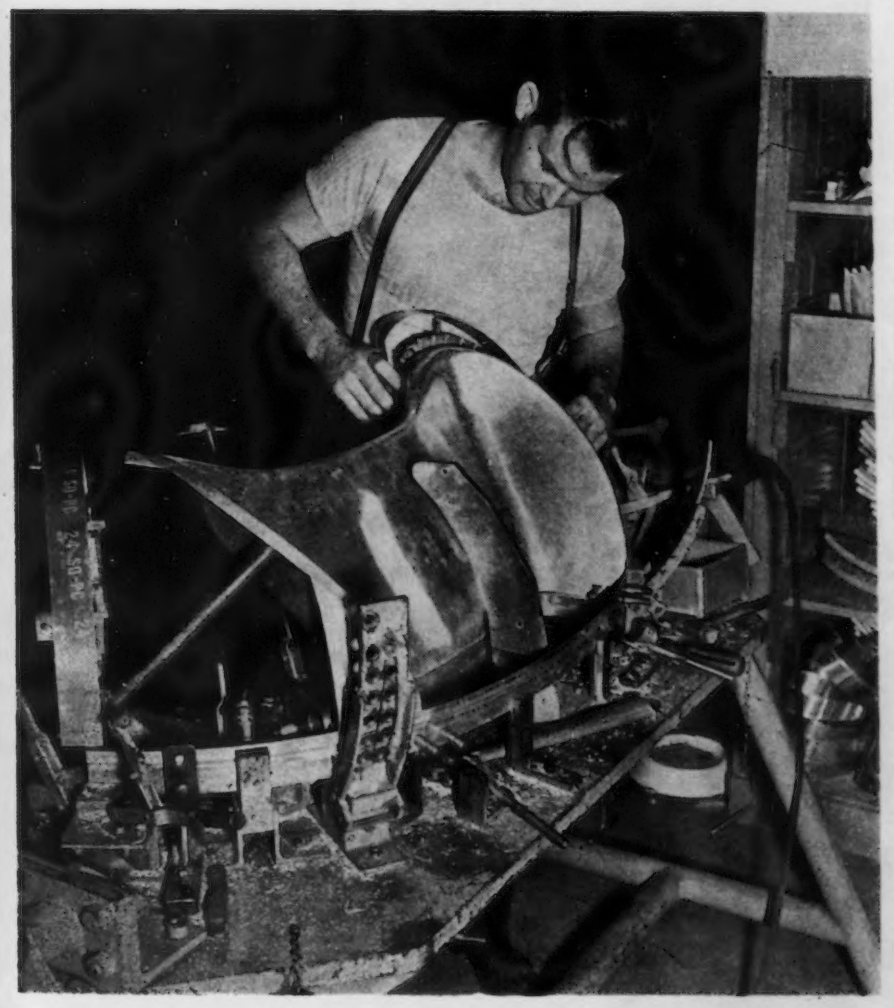
By V. E. CHILDERS
Chief Tooling Inspector, Vultee Field Division Consolidated Vultee Aircraft Corp.

. . . Use of master tools for coordinating production tools and inspection gages assures positive interchangeability of parts on the assembly line with a minimum of inspection during manufacture of component parts. Where inspection is necessary, the use of inspection jigs greatly speeds up the operation with unskilled help.

these master tools in turn are used as the pattern for making the production jig or fixture as well as numerous inspection gages.

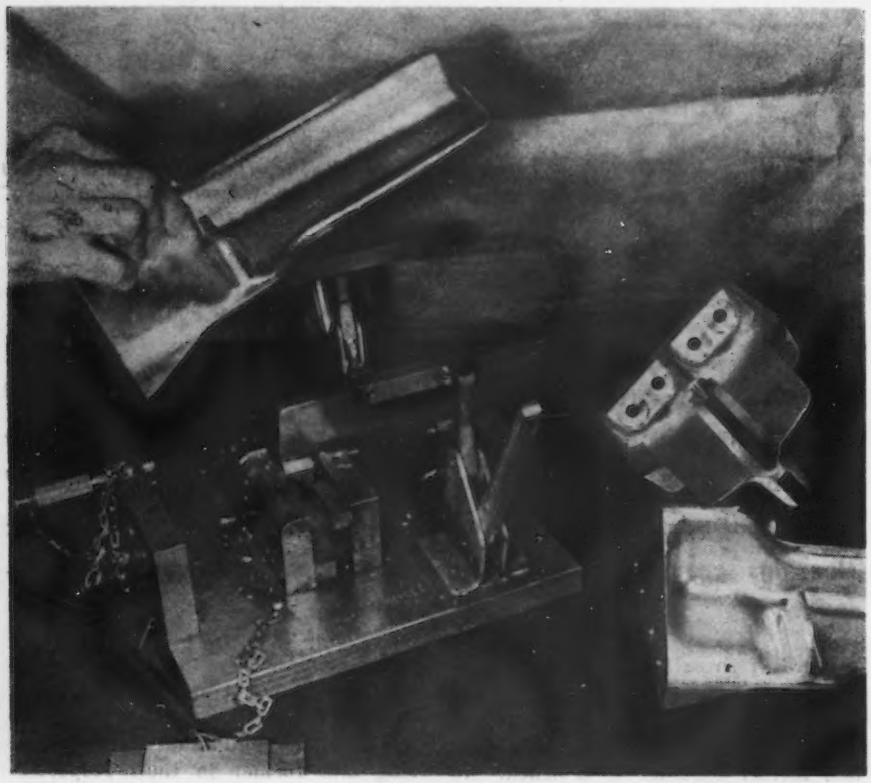
An example of this system can be found in the formers and inner ring in the B-24 nacelle assemblies. A master of the assembly is made, then from the master, tools for the former and inner ring sections are built, Fig. 2. In each of these parts the matched holes are located from the master both as to position and contour within a tolerance of 0.002 in. Since the same masters are used in the manufacture of these tools the parts built from the tools will be in perfect coordination. Assembly then becomes merely a matter of putting inner ring and former together on a bench. No separate assembly fixture is needed to hold the parts in alinement while being drilled as the holes were established in the individual parts of the ring and former in their respective jigs. The same applies to the holes of the former and inner ring into which Dzus buttons on cowling sections snap. Located from the same master which located the holes in the former and ring fixtures, the holes located from the cowling jigs are certain to match. Hence, along the assembly line it becomes merely a job of buttoning pre-drilled cowling sections into pre-drilled ring and former section. This plan effects true interchangeability.

FIG. 2—Trim and drill jig used in fabricating B-24 nacelles. Note inner ring, the semicircular strip in lower foreground. Hinged tabs provide drill hole patterns for the formers.



Tooling methods through the use of master tools enable Vultee Field to maintain a periodic inspection of all fabrication and assembly tools as well as inspection gages, which otherwise could not be done, due to the great number of tools and time required to make the necessary setups. Through this system it is possible to maintain fabrication, assembly tooling and inspection gages to such close tolerances with respect to the loft layout that production inspectors are not required to check the majority of parts or assemblies to the engineering blueprints. Production inspectors know if the parts fit the next assembly tooling they will fall well within the engineering tolerance. If the parts are not to be assembled through the use of tooling, inspection gages are provided for their check.

If the parts do not check to the tooling or to inspection gages, a tooling inspector is immediately called. He checks the previous fabrication or assembly tooling to the master tool. This is a relatively simple operation and the trouble can be located and corrected immediately. It is impor-



ABOVE

FIG. 3—Wing butt junction fitting is checked in a few seconds through the use of this inspection gage. Note holddown clamps, blocks beveled to check angle of fixture, upright center bar which fits into slot of fitting and checks its alinement, "go and no-go" plugs and feeler gages. The positions of the three fittings shown in the picture show the completed angles, faces and hole patterns which must be checked.

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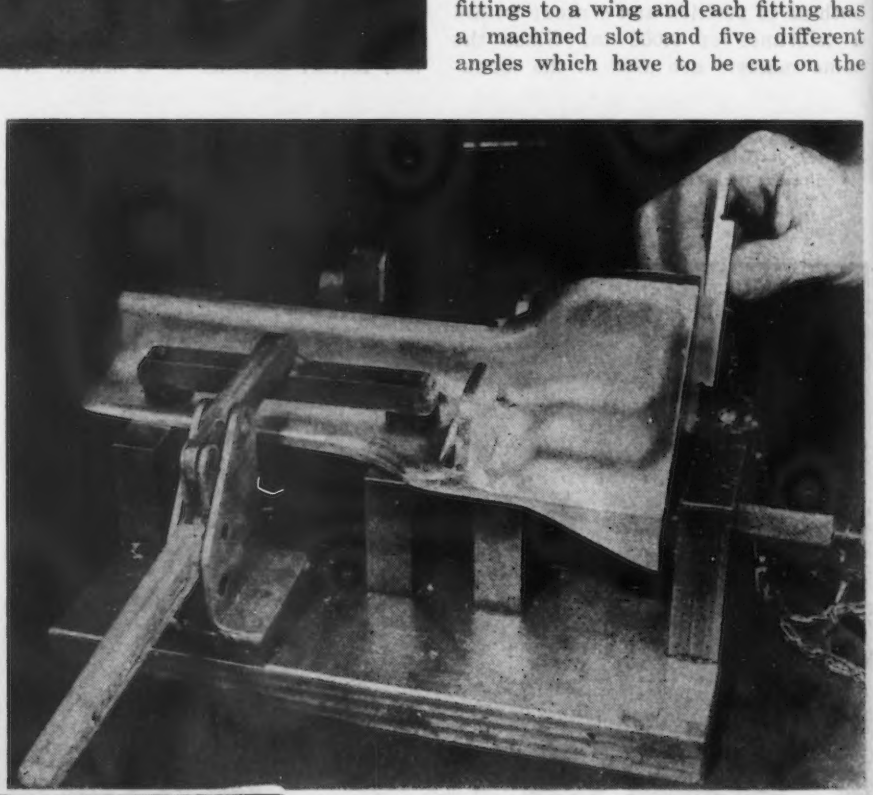
tant to keep in mind that the master tools are never used for production purposes or for any other purpose which would alter them from their original settings.

Applicable to Large Lots

As building master tools requires the work of highly trained designers, tool makers and inspectors, it is a process probably prohibitive in cost if production were set for only a few planes. When spread over contracts calling for hundreds of planes, the cost is justified. Vultee Field tooling men estimate that this system, compared with that previously used, has accounted for a saving of 40 per cent in production time through fewer rejected parts, easier assembly and elimination of such bottlenecks as complicated final assembly fixtures and detailed inspection.

A good example of the saving in inspection time is the wing junction butt fittings. There are eight of these fittings to a wing and each fitting has a machined slot and five different angles which have to be cut on the



ABOVE

FIG. 4—Wing butt fitting held in the gage showing how feelers and "go and no-go" flat plugs are used.

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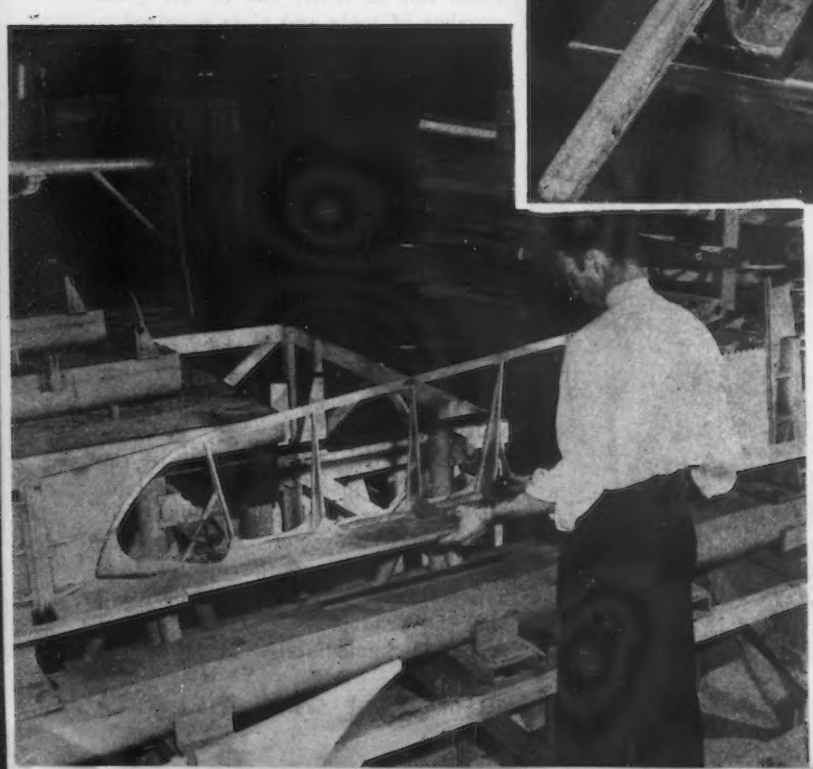

LEFT

FIG. 5—This inspection gage enables an inspector to check a completed elevator for a BT-13a in a fraction of the time that would have been required by setting up on a surface plate and checking to blueprints. Here the inspector is using a wooden template to check contour.

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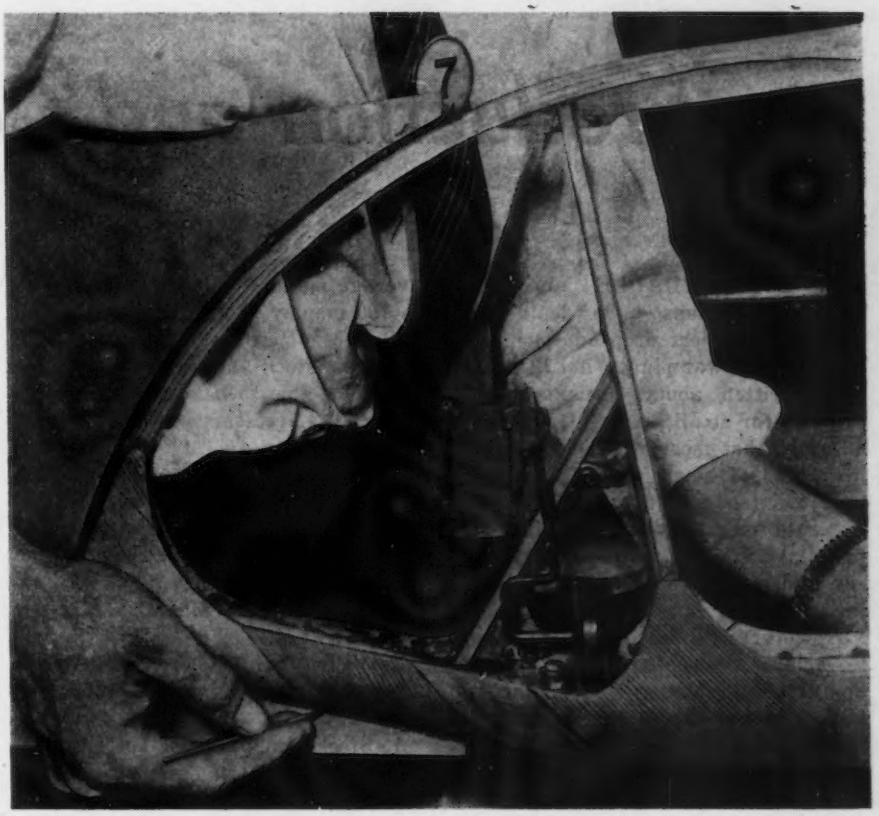
RIGHT

FIG. 6—Contour of the elevator's tip can be checked with the feeler gage shown here. Note hinge bracket location point in foreground.



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faces of the part. To make a precision setup on each of these parts and check them as close as plus or minus 0.005 in. would require the services of a skilled inspector using precision tools and would take many valuable manhours of time to check. This same part in Vultee's type of inspection gage requires only the services of a junior inspector, as the operation is purely mechanical when performed in the inspection jig shown in Figs. 3 and 4.

Another example of how inspection gages have decreased the amount of hours of inspection time is the gage in which the completed elevator is checked, Figs. 5 and 6. Held in the gage by pins thrust through the hinge brackets, Fig. 6, the assembly can be checked for contour, size, alinement of tab hinge and location of the torque tube. Without such a gage, Vultee Field would have to have the services of an experienced inspector and spend at least 2 hr. on each assembly in setting it up on a surface plate and making the same checks as can be accomplished in a few minutes when the gage is used.

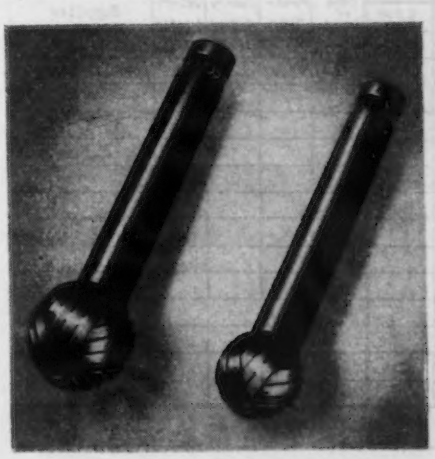
To a certain extent, the elaborate tooling method just discussed was necessitated by the availability and character of manpower for plant expansion. As the quality of the average workers pre-factory experience decreased, it became necessary for the quality of the tools to increase and be made as nearly foolproof as possible so that even though the skill of the workmen has decreased, the quality of production parts has not been affected.

It has been the experience here that although the type of tooling described is considerably more costly than other types which could have been used, the savings effected by it in such ways as less production inspection time, less rejected and reworked fabricated parts, and less assembly time more than offset the extra initial expenditure.

Cemented-Carbide Burring Tools

CEMENTED-CARBIDE burring tools (rotary files), are announced for the first time by Carbur, Inc., Lincoln Park 25, Mich., as the result of five years of research and development work in the grinding and forming of cemented carbides. The tools, to be known as Carburs, have cutting teeth ground from the solid on special machines designed for the purpose. The cemented-carbide heads are securely attached to the steel shanks by a new process.

From the results of tests conducted in actual production and in the aircraft industry in particular, it is indicated that Carburs will provide at least 50 times the tool life of high speed steel burring tools. One report from an aircraft engine manufacturer supports the claim that these tools lasted 100 times longer than steel burring tools in production use in both cylinder heads and crankcases.



By providing a sharp cutting edge over a long period of time, these tools reduce burring time per part and generally increase efficiency in burring operations in all types of production. Because of their wear-resistance, less replacement is necessary and inventories of burring tools can be reduced considerably. Tool sharpening is reduced in proportion to the life of the tool. Carburs can be run at much higher speeds than have been possible with steel tools—another factor in reduction of finishing time.

At the present time, Carburs are supplied only in ball end types in ⅜ and ½ in. sizes. The shanks are ¼ in. diameter and the burring tools are 2½ in. overall. Other sizes and shapes are under development.

Production and Cost Control

A CONSIDERABLE number of publications have dealt with the subject of production control in large war plants, but little has been written about efficient control systems for small plants. It has been observed that most of the owners and managers of small plants are reluctant to introduce any such suggested accurate methods, fearing that the installation of elaborate office machinery and expensive file systems would increase their overhead considerably.

However, with the present tendency to include more plants with smaller production capacities in the war effort, management must comply with all cost and material control regulations of the government agencies, and in order to have a basis for accurate bids, a detailed cost control system is necessary. Such a system must keep the management informed not only about actual production cost and material consumption within the different departments, but also about each job and each piece manufactured, so that ways and means can be found to decrease excessive costs for certain parts.

The following plan for complete cost and material control has been in operation for more than a year, and provides a maximum of accuracy with a minimum of clerical work in office and shop and avoids complicated bookkeeping. It could be adapted to any average metal working plant with up to 100 employees.

One cost accountant and one combination stock clerk and expediter should be able to handle the files and material. Necessary equipment consists of:

(a) Standard filing cabinets with visible lower edges, for cost accounting cards and perpetual inventory.

(b) Job recorder punch clocks (one for each department). (Type: International Business Machines Co., or similar.)

(c) Five printed or lithographed forms of 5 x 8 in. standard size, as follows:

1. Stock and purchase record card.
2. Stock room inventory card.
3. Shop order (pads).
4. Cost accounting card.
5. Parts requisition (pads).

Step 1

After an incoming job has been analyzed and bills of material made out, purchase orders for the needed materials are prepared. One copy is sent to the accountant in the shop office, who transfers the data to a stock and purchase record card, Fig. 1. The sample entries shown are followed through all cards. Each card is filed alphabetically according to items. Groups like steel shapes, sheets, screws, screw machine parts, stampings, etc., should be subdivided by a fixed downgrading system. Such a method should be laid out in advance in order to insure uniform entries and to avoid misplacing of cards.

A green indicator flag is slipped under the celluloid edge of the visable index file packet to show that a shipment is due; should it become overdue, a red flag is substituted to facilitate follow-up measures.

Most of the federal contracting agencies require that material purchased by or supplied to the manufacturer under a cost-plus-wage contract shall be accounted for separately for each individual order; consequently it will be necessary to fill out one card for each new job order on which the same item appears. The same card should be used if material is reordered for a job. After the job has been completed and the needed amount of material withdrawn, it can be seen at a glance how much is left to be transferred to another job order, or whether this account has been "overdrawn" so that material had to be transferred to it from another account.

Step 2

All incoming materials are received and checked by the stock clerk, who enters all items on stock room inventory cards, Fig. 2. Only one inventory card for each item is necessary in the stock room, since the distribution of materials according to job orders may be followed up through the office file. It does not make any difference for which job order a steel bar or a screw is actually used as long as their final destination has been properly entered on the inventory card.

To insure complete coordination between stock room inventory and office file, the stock clerk should take all inventory cards on which any entry has been made during the shift (addition or deduction) to the office, where they are checked off and the entries copied in the stock record file, after which the cards are returned to the stock room.

Step 3

After the material for the manufacture of a certain part has been received, a shop order form, Fig. 3, bearing a consecutive number and the

FIG. 1—The stock and purchase record card is filed in a visible index file tray. Each card is filed alphabetically according to product (see arrow).

Remarks :

Date	P.O. No.	Quant. In	Date	Piece No.	Shop-O. No.	Quant'y out	Balance	PURCHASE - RECORD				
								Date of Order	Purch.-Order	Quantity Ordered	Delivery Scheduled	Supplier
2-7	43-15	180 FT.	2-9	16 S-514	23 N-56	100 FT.	80 FT.					
			2-12	16 S-514	23 N-56	80 FT.	—	1-5-43	43-15	180 FT.	2-5	U.S.S., CHICAGO
2-15	23 N-56	8 FT.					8 FT.	1-28-43	43-108	200 FT.	2-25	J.R.&.Co., N.Y.
2-28	43-108	200 FT.					208 FT.					

Material & Size :
STEEL, BAR: COLD DRAWN, 1-1/16 " DIA.

Job Order No.:
N - 56

in a Small War Plant

By W. FLATOW
Production Engineer,
Spokane Stove Works,
Spokane, Wash.

. . . This plan, devised for a metal working shop employing less than 100 people, should serve as a guide for setting up similar systems elsewhere, particularly where war work has been taken on a cost-plus basis. It entails the use of five simple, typed forms and the time of one cost accountant and combination stock clerk and expediter.

job order number, is filled out in the office. These shop order blanks are printed in pads, with several copies in different colors, a different color for each department. In an average plant, four or five copies will be adequate, but should there be many different shops, one color may serve for related departments, such as foundry and pattern shop, or finishing departments such as painting, plating and polishing shops.

All copies for a certain order, with the exception of the white original, are pinned together and sent to the stock clerk, who in turn transfers the indicated material to the foreman of the first department shown on the order, together with the first copy of the order. This copy is retained by the foreman until the piece is entirely through this shop. After completion of the parts, or completion of the first partial delivery, they are sent to the next shop, together with the remaining copies of the order. The same procedure is followed until the pieces are finished and returned either to the stock room or the assembly line. Shop copies of the order are returned to the office as soon as all the pieces have left the department, to be kept on file until completion of the order. The returned order slips show at a glance through which shops the parts have passed.

The transfer of parts from one shop to another should be combined with an inspection and check on the quantities, in order to catch incorrect parts or amounts as soon as possible. All movement of parts between the departments should be done by the expediter, or the person who is responsible for the inspection. Quantities of parts leaving one department should be marked down on the shop order copy, as well as the rejected parts.

STOCK ROOM INVENTORY

MATERIAL : STEEL, BAR : COLD DRAWN 1-1/16 " DIA.

IN			OUT			AVAILABLE
Date	Order No.	Quantity	Date	Order No.	Quantity	Quantity
2-7-43	43-16	180 FT.	2-9	23 N-56	100 FT.	80 FT.
			2-12	23 N-56	80 FT.	
2-15	23 N-56	8 FT.				8 FT.
2-24	43-74	40 FT.				48 FT.
			2-26	56 A-19	35 FT.	13 FT.
2-28	43-108	200 FT.				213 FT.

RIGHT

FIG. 2—The stock room inventory card records all additions and withdrawals from stock. After each shift, data from such cards are posted to the basic stock and purchase record card shown in Fig. 1.

BELOW

FIG. 3—Shop order forms follow the work through the shop after the necessary material is issued by the stock clerk upon receipt of one of these order forms.

SHOP ORDER NO. 23....(N-56)... Date FEB. 8, 1943

QUANTITY ordered 256 required 250 — Piece No. 16 — Drawg. No. S-514 — SHAFT

DEPARTMENT	Date In Out	sgd. Initial	Part. Delivery Date	Good	Rej.	Part. Delivery Date	Good	Rej.	Part. Delivery Date	Good	Rej.	Compl. Delivery Good	Rej.
MACHINE SHOP	2-9 2-16	J.B.	2-12	112	2	2-16	140	2				252	4
HARDENING SHOP													

Filled out by RLS

Date filed in office 2-17-43 N.F.M.

Remarks : COLD DRAWN STEEL 1-1/16 " Dia. (about 170 ft.)

Material issued : 2-9 : 100 FT. 2-12 : 80 FT. 2-15 : Returned 8 FT.

Where parts of similar shape and name are handled, confusion may be avoided in the shop if a blueprinted sketch or detail drawing is pasted on the back of the shop order copies.

Step 4

A cost accounting card, Fig. 4, is based on the white original form of the order. This card is printed on both sides, the front side showing operations, subdivision of costs, material and other data, while on the back is noted the actual labor time for the piece. The piece number is typed in the upper right-hand corner of the front side, and after the cost has been compiled, the card is filed in numerical order for future reference.

COST - RECORD for SHAFT S-514-16

Oper'n No.	OPERATION	Pieces p.hour	Time p.pce.	Rejects No.	Rejects %	Mach. rate'td.	Labor Cost	Overhd. %	Total Cost
1	Cut blanks	70				$ 14	2 78		
2	drill center holes	80				$ 17	2 92		
3	Machining in lathe		17 min.	2		$ 6	96 68		
4	Milling flats		9 min.			$ 10	20 23		
5	Deburring	20					12 08		
6	Hardening & tempering		5 min.	1			26 33		
7	Straightening	16					16 11		
8	Grinding		10 min.	2		$ 12	47 83		
9									
10				5	2				
11									
12									
13									
14									
15									
16									
					Total		224 96	55.1	348 91

Material Cost 172 FT.	$ 46.50	Total Cost per order	$ 401 81
Freight, Cartage & Handling	$ 6.40	No. of Pieces made 251	
Total Material Cost	$ 52.90	Total Cost per Piece, 15	$ 1 601
Weight (blank): 2.2 LBS/PC.		Surplus in Stock 1.	

Shop Order No.	Piece No.	Item	No. of Pieces ord.	Sched. Delivery
25 N-56	S-514-16	Shaft	256	7-15-43

FRONT SIDE

LABOR TIME RECORD

OPERATOR NO.	WAGE SCALE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
64	75	2.15															
37-45	90		3.24					5.90									
12-15-24-6	1.10			8.00	8.00		5.16		8.00								
19-45	90					6.34		8.00									
72-12-24-6	1.10			8.00	3.54		8.00		8.00								
18-19-45	90					4.16		4.00									
64	75	1.56									(TIME MARKED IN						
12-15-24-6	1.10			8.00	5.65		8.00		4.23								
12-15-24-6	1.10			8.00	1.20		2.78		8.00		HOURS & 1/100 OF						
12-6	1.10			8.00					8.00								
12-6	1.10			8.00					7.25			AN HOUR)					
12-6	1.10			4.25													
12	1.10			8.00													
12	1.10			4.00													
19	90					2.92											
12	1.10			8.00													
12	1.10			8.00													
12	1.10			7.10													
Total Time		3.70	3.24	87.35	18.39	13.42	23.94	17.90	43.48								

BACK

FIG. 4—This cost accounting form is printed on both sides. Detailed entries on the back side (bottom) are eventually totaled and transferred to the front side to record the summarized cost of each operation.

PARTS - REQUISITION FOR 250 UNITS

In connection with Shop Order No.	Assembly No.	Item	Card filled out Date	Name
20 (N-56)	S-514	SWITCH GEAR	7-15-43	PLS

NAME OF PART & NUMBER		SIZE	QUANTITY	TOTAL COST
GEAR HOUSING	S-514-1		250	9747 54
COVER	S-514-2		250	2148 64
GASKET	S-514-3		500	89 40
BEARING	L-47-A	1" D.	1000	1987 80
Shaft	S-514-16	1" x 7-3/4	250	400 25
COVER BOLT, HEX.: STEEL, ZINC PLATED		3/8-16 x 1½	1500	137 28
etc.				

CHECKED BACK IN OFFICE	REMARKS :	TOTAL $
3-25-43 N.F.M.		

FIG. 5—Parts necessary for a given number of assemblies are requisitioned from the stock room through the use of this form, which also records total costs of all parts on the order. Corresponding data have been carried through all five forms to clarify their use.

This card has to be prepared by somebody familiar with the course of operations to be followed through the shops during the production run of the part. It has been found useful to copy this course of operations on the back of the shop order forms at the same time, thus facilitating the handling of the parts and giving the operators some help in designating their work on the daily time card. They may also simply mark down the number of the respective operation on the time card.

Sixteen vertical columns on the back of the card correspond to the number of operations on the front side. Any operator doing work on a certain part (which is shown on his daily time card) is indicated at the left side of the card by his payroll number and his wage scale, and his work time is entered in the column of his operation. The same horizontal line may be used for several workers under the same wage scale. Upon completion of the piece, all columns are totalled up, and the results, now representing a dollar value, are transferred to the corresponding space on the front side of the card. The actual labor cost is then multiplied with the governing overhead factor to obtain the total labor cost.

For future estimates under a changed overhead, a fairly accurate picture of the cost to be expected can be obtained, by multiplying the actual labor cost with the new factor, since it can be assumed that the actual time for making the part will not vary very much unless the production method has been changed.

Step 5

When all parts for the assembly of a certain item are available, a parts requisition form, Fig. 5, is typed in original and one colored copy. The stock clerk uses the copy as a basis for the supply of parts for a required number of units to the assembly, and the accountant lists the total cost for the indicated number of parts (as derived from the cost accounting cards) on the right side column of the original. The grand total of these figures shows the actual manufacturing cost for the given number of units.

The parts requisition consists of as many sheets as are necessary for a complete list of material. The shop order number in the upper left corner ought to be the same as the number of the main part of the assembly, and the assembly time should be charged to this part to simplify handling. The same policy has been followed in the

(CONCLUDED ON PAGE 148)

New Equipment . . .

Motors and Controllers

Recent developments in motors and controlling equipment for industrial plants and factories are described herein.

Hollow-Shaft Motors

A NEW line of vertical high-speed hollow-shaft synchronous motors have been announced by the Motor Div. of the *General Electric Co.*, Schenectady, for pumping applications where a large volume of fluid is handled. The motors have a drip-proof enclosure, with the top cover removable to permit adjustment of the pump shaft. In addition, easy access to the brushes and the collector rings is obtained by unlatching a flush-mounted steel plate. The motors can be furnished in ratings from 100 to 1000 hp. and speeds from 514

to 1800 r.p.m., with non-reverse ratchets to prevent reversal of pump rotation at shutdown or on starting. They are also available in solid-shaft construction.

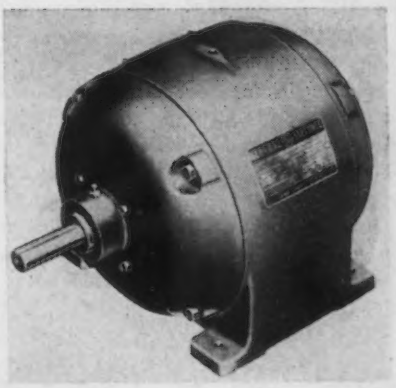
Vertical D.C. Motor

A NEW line of d.c. vertical motors ranging from 40 to 200 hp. at 1750 r.p.m., and in equivalent ratings at other speeds, has been announced by the *General Electric Co.* Furnished for both constant and adjustable speeds, they are designed for low-thrust, solid-shaft applications on pumps, machine tools, and marine underdeck auxiliaries. The motors are of drip-proof, protected construction. Convenient fittings on upper and lower bearings simplify lubrication and provision for the escape of excessive grease reduces the possibility of over-lubrication. A special bearing housing prevents grease from entering the motor and damaging the commutator and windings. The con-

duit box can be arranged for bringing the leads in at top, bottom or either side. Two easily removed handhole covers permit inspection of the commutator and brushes. The ring-type base has an accurately machined rabbet and jig-drilled mounting holes.

Enclosed Motor

AN addition to the group of Tri-Clad totally enclosed motors has been announced by *General Electric.* Available in both the polyphase, 60-cycle, induction type and the single-phase, 60-cycle, capacitor type, the new motors are designed for use under conditions where abrasives, chemicals, rain, snow and excessive dirt are encountered. The polyphase motors are furnished in frame sizes 203 to 225 and range from ½ to 2 hp. at from 900 to 3600 r.p.m. The single-phase motors are furnished in frame sizes 203 and 204 and range from ¾ to 2 hp. at from 1200 to 3500 r.p.m.



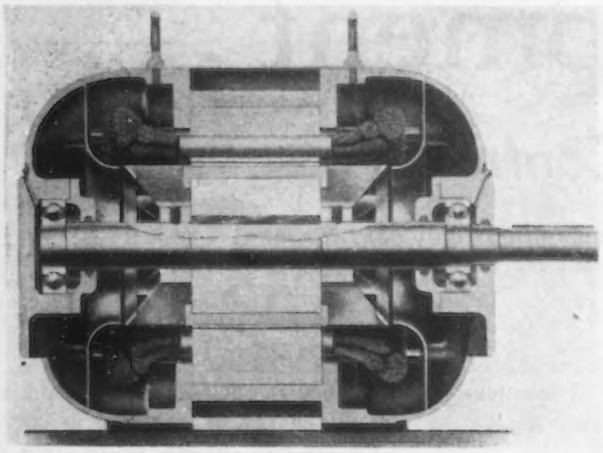
A rotating labyrinth seal prevents dirt, oil or water from entering the bearing housing. The motors are wound with Formex wire.

Motor Starter

A TYPE H motor starter has been announced by *Allis-Chalmers Mfg. Co.*, Milwaukee. Designed for low first cost, the new starter is a metal enclosed structure similar to metal-clad switchgear. High interrupting capacity disconnecting-type fuses are utilized in combination with a heavy duty oil switch. The starters have been developed for both induction and synchrouous-type motors rated up to 1000 hp. at 2300 volts and 1750 hp. at 4600 volts, 3-phase, 60 or 50 cycles. Their usages cover full or reduced voltage starting, dynamic braking, reversing and special applications. Short circuit protection up to 160,000 kva. at 2300 volts and 320,000 kva. at 4600 volts is said to eliminate the need for a back-up breaker within these kva. ratings.

Induction Motor

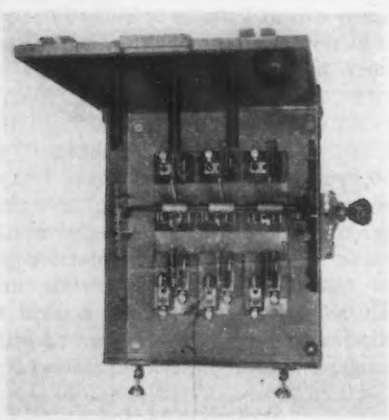
THE RS drip-proof induction motor developed by the *Lima Photo Engraving Co.*, 100 West North Street, Lima, Ohio, is built in sizes from ½ to 75 hp., 2 or 3 phase, a.c.



current. It has been designed to afford maximum protection against chips and filings, drippings or splashing liquids, and is adaptable to machine tools and production equipment and locations where a totally enclosed motor is not especially needed. The units are equipped with heavy-duty ball bearings, heat-treated ground shafts, dynamically balanced rotors, heavy rugged frames and the phase insulation is heavy varnished duck.

Marine Switch

AUGMENTING its present single-throw Type K marine switch, *Square D. Co.*, Switch & Panel Div., 6060 Rivard Street, Detroit, has announced a new line of double-throw switches built to Government requirements. The switches are splash proof and designed to withstand shock tests as specified by the Navy. They are available in 2 or 3 pole, from 30 to 100 amp., 250 volts d.c., 575 volts a.c., either fusible or not fusible. The 575 volt a.c. switches have 250 volt (Navy) fuse spacings.

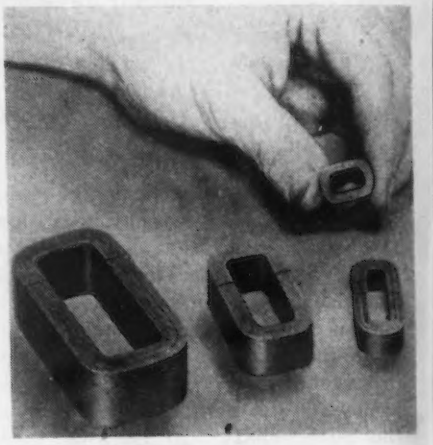


Switch Cases

COMBINING a relay and knife blade test switches in the same unit, the new type FT Flexitest cases for panel mounting are announced by *Westinghouse Electric & Mfg. Co.*, East Pittsburgh. Standard relay elements are mounted on a removable unit chassis. Test connections can be made either by clip leads or test plug. The test switches are of high capacity, self-aligning knife blade construction with the movable blade and hinge jaw mounted on a molded block, rigidly fastened to the case. Each circuit can be identified by cards on the switch handle, and a red handle identifies the trip circuit. Three size cases are available. All have a metal cover with a transparent window for inspection of elements and observation of relay targets.

Magnetic Cores

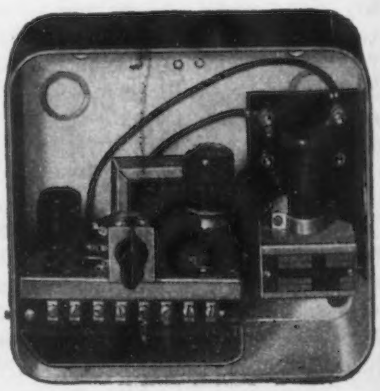
AVAILABLE in a wide range of sizes, a new line of type C Hipersil cores, announced by *Westinghouse Electric & Mfg. Co.*, East Pittsburgh, combines one-third more flux-carrying capacity with the same size and weight, and involves only 2 or 4 pieces. The Hipersil strip is wound continuously on a mandrel of desired dimensions, annealed at high temperature and vacuum impregnated with a plastic compound to make it a solid unit. It is then cut in two segments, the ends of which are machined and worked to produce coinciding surfaces when reassembled. Cores are assembled on coils by means of metal bands tightened to insure correct tension. The butt joint eliminates cross fluxes or masking effect, each joint being equivalent magnetically to 0.0005 in. air gap. Steel cores of nominal gage are used for frequencies up to 400 cycles; for higher frequencies, a core using thinner Hipersil steel has been designed,



and for very high frequencies and exceptional fidelity, a still thinner gage is available.

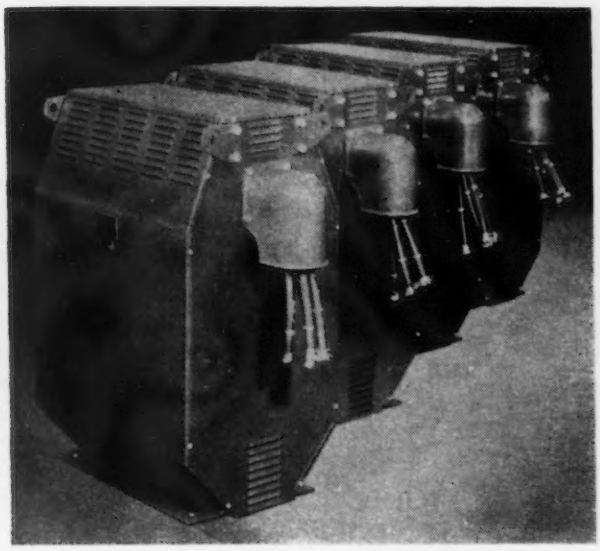
Electronic Time Relay

A COMBINATION of two hermetically sealed units, both of which are safe in explosive and corrosive atmospheres, an adjustable electronic time relay has been built by *Durakool, Inc.*, 1010 N. Main Street, Elkhart, Ind. The principle of operation is electronic, and the load is carried by a quick-acting Durakool mercury relay. The only moving part is the fast-operating, steel-encased plunger working in a hydrogen pressure atmosphere, displacing the mercury. Time settings are continuously variable within the range and may be adjusted to the required operating point. Standard models cover time ranges from 0.05 to 0.5 sec., 0.10 to 10, and 1 to 100 sec., respectively, with special models available up to 5 min. Contact capacities can be supplied up to 75 amp., either normally open or normally closed.



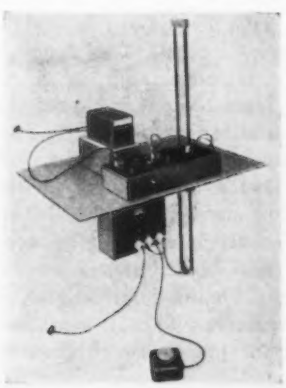
Dry-Type Transformers

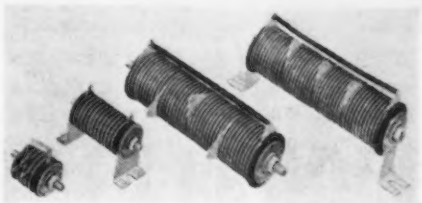
A NEW series of dry-type natural-draft transformers, announced by *General Electric Co.*, has louvered side plates which slant inward at bottom and top of the case, thus permitting a directed flow of air through the case vertically. A two-legged core with a high-voltage and a low-voltage coil on each leg is clamped at top and bottom, with the bottom clamps also serving as mounting feet. The top clamps are used for lifting the transformer. The coils are exposed for maximum cooling with a large portion of their copper outside the core. The high and low voltage coils are concentric with air ducts between them. Use of two small coils instead of one large coil has permitted the use of more turns of smaller wire for the same copper loss, resulting in lower exciting current and lower inrush currents when the primary of the transformer is energized.



Coil-Turn Counter

A COIL-TURN counter for laboratory or factory use in determining the number of turns in wound electric coils has been announced by the Special Products section of the *General Electric Co.* It is said to be capable of checking or determining the effective turns of coils ranging from 1 to 11,110 turns at a rate of from 80 to 100 coils of like specifications per hr. The unit incorporates a magnetizing current control box, a portable light-beam galvanometer, two yoked test rods, a galvanometer control panel and a foot-operated switch. The dials on the galvanometer control panel are set to the number of turns the coil should have, and when deflection is corrected, the dial reading shows the number of turns the coil being tested has. The reference coils are enclosed in the galvanometer control case, while test rods are mounted on the case. The accuracy of the counter is said to be one turn in a thousand for coils having air cores at least 5/8 in. in diameter, an o.d. of 8 in. and less, a coil build-up of 2 5/8 in. and up to 5 in. in height.



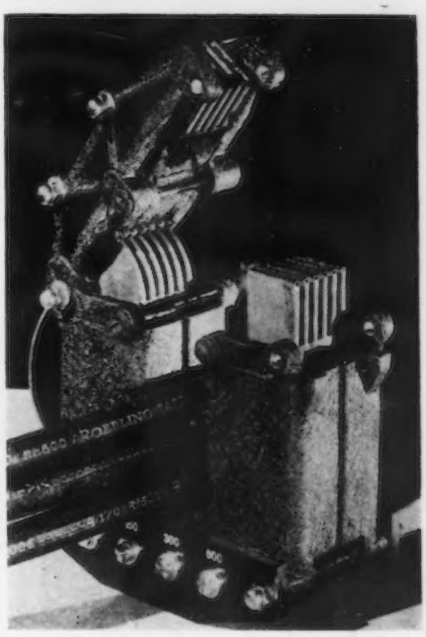


Selenium Rectifier Stacks

SELENIUM rectifier stacks have been added to their tungar and copper oxide rectifier line, it has been announced by *General Electric's Appliance & Merchandise Dept.*, 570 Lexington Avenue, New York. Higher operating efficiencies between the a.c. input and d.c. output are made possible by a new and patented manufacturing process. The light weight, small size stacks can be arranged to obtain higher current output by connecting the stacks in parallel, and higher voltage ratings can be obtained by connecting the stacks in series. They can be bolt or stud mounted directly to equipment assemblies. They are also available with mounting brackets of various types for convenient assembly to panels, etc. The company manufactures all three of the commonly used types of rectifiers—Tungar, copper oxide and selenium.

Split-Core Current Transformer

THE new transformer introduced by the *Esterline-Angus Co., Inc.*, Indianapolis, Ind., makes use of an interleaved type of joint in the core, which is said to give a much lower reluctance and magnetizing current than the butt joints. The movable joints are made to be a series of tongues and grooves, which give an air gap of short length and have an area about 10 times that of the cross-section of the core. The corners of the tongues and grooves are well rounded and the leaves slide smoothly into the slots. The laminations are clamped securely between cast aluminum housings. One end of the movable section of the core is hinged, while provision is made for clamping and locking the other end. The coils are impregnated to exclude moisture, and the exterior is protected by a cast aluminum housing. The housing is so designed as to protect the vital parts of the transformer in use.



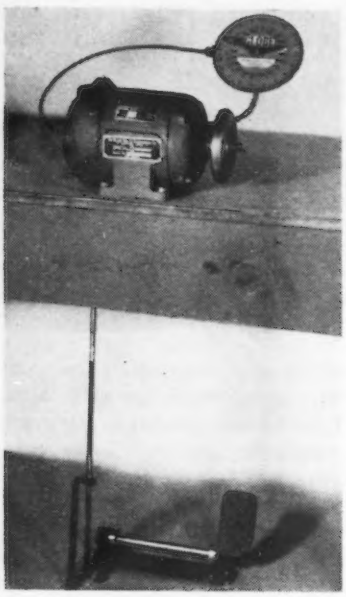
Motor-Alternator Sets

A NEW line of two-bearing, 3600 r.p.m. motor-alternator sets in integral ratings up to 5 k.v.a., single phase, for converting d.c. to a.c., has been announced by the *General Electric Co.*, Schenectady. The alternator, which has a field connected with the motor armature in series, is driven by the motor. An increase in the alternator load causes an increase in the motor load, so that increased d.c. is drawn from the line, which strengthens the alternator series field. The armature windings of the motor and alternator are on the rotating

elements and the fields are stationary. A solid shaft, supported by a ball bearing at each end, serves to mount the rotating members of both the motor and alternator.

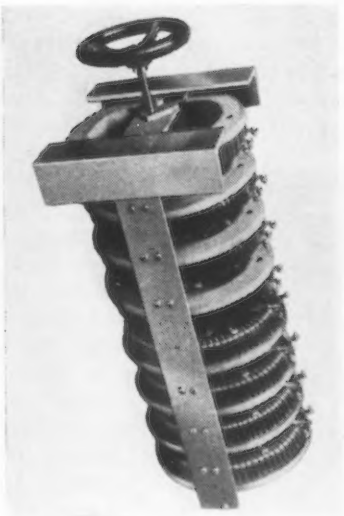
Coil Winder

A NEW series of high-speed variable-speed coil winders for a.c. operation, announced by the *Globe Tool & Engineering Co.*, 428 Davis Avenue, Dayton, Ohio, has a range of speeds from 10 to 4000 r.p.m. Control of the self-energizing brake, motor switch and speed control is synchronized from a floor-mounted foot pedal. The direct drive bench model is said to be capable of winding wire sizes from No. 20 to No. 42 into coils up to 3 in. diameter and 3 in. long. A visual counter is provided, showing up to 10,000 turns, and is easily read at high speeds. A spindle is provided for easy attachment of winding forms.



Tandem Rheostat Assemblies

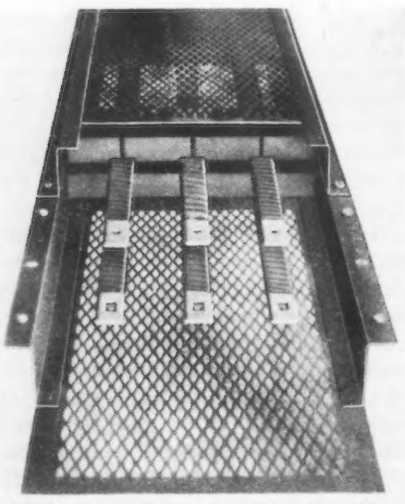
THE tandem unit put on the market by *Ohmite Mfg. Co.*, 4835 Flourney Street, Chicago 44, consists of eight Ohmite Model U, 1000 watt, 12 in. diameter rheostats controlled by a single handwheel. Other tandem assemblies can be made up of two, three or more rheostats, ranging in power rating from 25 to 1000 watts and diameter from 1-9/16 to 12 in. Rheostats in tandem are insulated from each other so they may be used for simultaneous control of several circuits or phases of a circuit by means of one knob, or two can be separately controlled by means of concentrically located knobs. Tandem rheostats are also available in taper



windings and the same range of resistance values as individual units.

Feeder Bus Duct

A REDESIGNED feeder bus duct of the ventilated type having a screened casing of expanded metal in place of the solid casing formerly used has been introduced by the *Bull-Dog Electric Products Co.*, 7610 Jos. Campau Avenue, Detroit. The paired-phase bus bar arrangement within the casing assures uniform current density through reduction of "skin effect" and "proximity effect," it is claimed. Available in the new WPB ratings of 800, 1000, 1350, 1500 and 2000 amp. single phase, 3 phase and 4 wire 3 phase, 600 volts or less, it can be used for feeders alone or in conjunction with the company's branch circuit plug-in type Bustribution duct.

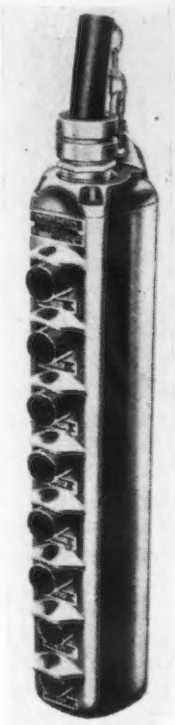


Blackout Lamp

A BLACKOUT lamp designed to provide a quick, easy and economical method of supplying sufficient illumination for ease of movement during blackouts is being manufactured by *Sylvania Electric Products Inc.*, Salem, Mass. The lamp is an A-15 type bulb, coated black except for a 1-in aperture in the bulb end which emits an orange-red light. Having a 14-watt filament, the blackout lamp is available in two voltage ranges: 115-125 volts and 30-34 volts. At present this lamp is available only on a priority rating better than A-2.

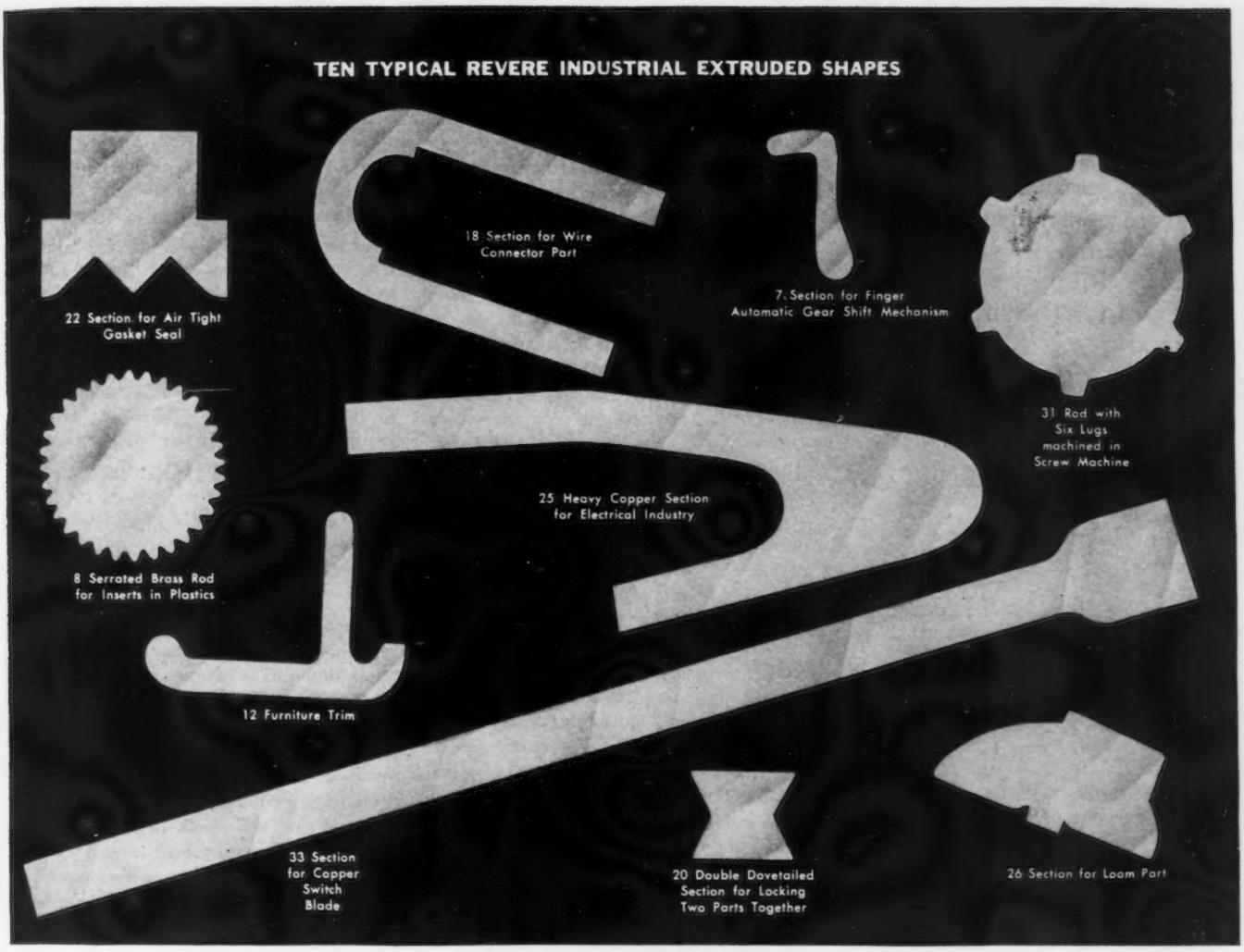
Speed Push Button

NORTHERN ENGINEERING WORKS, 2615 Atwater Street, Detroit, has developed a multiple speed push button which provides up to five speeds in a single button. As the button is pushed in, it moves a metal cylinder to wipe over a succession of contacts. The contacts are steel balls mounted on springs, stiff enough so the operator can "feel" the successive clicks, but not stiff enough to make the button difficult to operate. While designed primarily for crane and hoist operation, the button is easily adaptable to any machine where pilot or relay circuits are used. It is said that in tests of more than two million operations on a single button, no serious wear was noted.



Portable Floodlight

ANOTHER Circulite portable floodlight is offered by the *Steber Mfg. Co.*, 2451 North Sacramento Avenue, Chicago. The floodlight assembly is adjustable in a vertical range from bottom to top of the 6 ft. pipe standard at any angle and horizontally at 360 deg. radius. A cast iron circular base 20 in. in diameter provides stable footing. Either 300 or 500-watt lamps can be accommodated and clear convex or stippled convex diffusing heat-resistant lenses are available. The 12-in. reflector is chromium plated for high reflecting efficiency.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How REVERE INDUSTRIAL EXTRUDED SHAPES Can Speed Production • Cut Down Costs

On some not-too-distant tomorrow, you'll be going again full-blast.

Take Time by the forelock. Investigate today the uses of Revere Industrial Extruded Shapes.

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The process is extremely versatile, producing cross sections of unusual form which, in many cases, can take the place of simple forgings, sand or die castings.

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Result: A considerable saving in Tool, Metal and Finishing Costs—an overall saving of time, money, worry —and scrap!

In fact, the use of Revere Industrial Extruded Shapes offers possibilities so numerous that their limitations are determined only by the ingenuity of the user. Available in different alloys and sizes *as well as different shapes.*

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Assembly Line . . .

STANLEY H. BRAMS

• Truck manufacturers sight problems arising from post-war surpluses of Army trucks, parts . . . WPB authorizes production of civilian trucks next year . . . GMC purchase points up heavy truck interest.

DETROIT—The problems of disposition of Army surplus stocks are beginning to weigh upon the manufacturers of trucks and commercial vehicles. Industry steps are being taken this week to begin an intensive study of the general situation.

Since the outbreak of war in Europe in September, 1939, U. S. plants have probably produced about 1,250,000 military trucks. Large numbers of these have been shot up in battle, of course, and many have been lost at sea en route to war theatres. Others have been used up in domestic training. But the net number remaining in operation or in reserve is substantial.

This quantity is amplified by the fact that the Army has changed rather basic specifications no less than three times. As a result, trucks of then-obsolete specifications were stacked aside as new reserves.

On top of all that, reserves of spare parts are truly staggering. In accordance with military experience and judgment, as well as necessity, large scale ordering of spare parts was the rule during the early stages of the war and until recently. These were piled at depots throughout the country and the world. The need of completely stocking all such depots meant that the volume of spare parts required was far larger than the actual demands of replacement. Above and beyond that condition, extremely significant in itself, is the fact that in battle areas "cannibalization" has been extensively practiced on trucks, as on other equipment—that is to say, casualty vehicles are torn down, so their undamaged parts can be used for replacement in other units. This has served to reduce spare parts requirements in the field. Interestingly enough, "cannibalization" has served in large degree up to now to enhance the stock of low-hung components—axles, transmissions, gears and the like.

So bulky have the spare parts stocks become at some points that industry indignation may break out, perhaps a congressional investigation as well. Trade reports are that some military storage points are cutting down on their stocks of spare parts simply by piling them in kegs, and selling them as scrap metal at five cents a pound. Quite naturally, such purchases generally are being made by cut-rate dealers in automotive parts. The parts can be sold to the public within OPA price limitations but at huge profits.

THE truck industry viewpoint on what to do about the overhanging supply of trucks and parts is not yet crystallized. Canvass among the various manufacturers indicates that probably no more than half of the military vehicles which may be in suitable resale condition at the end of the war will be effective civilian units. Most of them, small and large, are 4-wheel and 6-wheel drives, and hence are not economical for civilian use except where hauling requirements are heavy. Some engineering departments have studied the advisability of replacing 4-wheel drive setups with new axles, new propeller shafts and other equipment, but have come to the conclusion that even after such rebuilding the trucks themselves would still be so heavy that they would be costly to operate.

However, it is recognized that if the Army does dispose of the many thousands of vehicles in its surplus stocks at the end of the war, there will be a civilian sale market if the prices are low enough, even if the trucks have obvious adaptability defects. Therefore, some industry officials are recommending that the government sell no trucks to civilians for a period of five years after the end of the war, utilizing such vehicles instead for reclamation and rehabilitation work.

Another viewpoint which is being expressed is that the government should adopt a policy of selling surplus vehicles and parts back to their manufacturers for distribution into accepted trade channels. This proposal is closely akin to the British government plan, which has already been operative for some few vehicle types in oversupply. Purchase price to the original manufacturer evolves from the original list price less a stated depreciation rate. The manufacturer re-sells the vehicle at the price paid the government, plus reconditioning charges representing cost of necessary parts and labor, plus profit of 15 per cent.

Although such a plan might be acceptable to truck makers now, when truck demand is intense, there is question whether it would be equally desirable after the war. Should raw materials be available in abundance to produce new civilian trucks, manufacturers probably would prefer to produce and sell them in a free market rather than buy and re-sell Army trucks not built for general use. Should wages undergo deflation after the war, manufacturers could produce and sell new products much more cheaply than they could dispose of Army equipment produced for war-level wages. But conversely, should the inflationary cycle continue, manufacturers might welcome opportunity to obtain such vehicles and parts for re-sale.

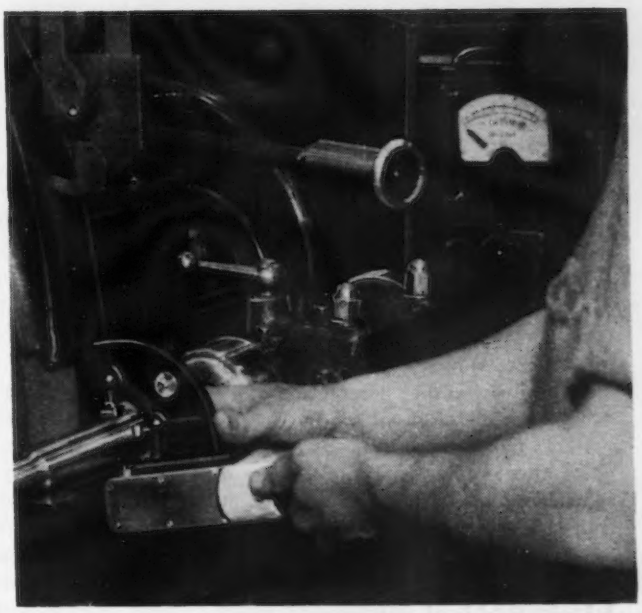
PRODUCTION of civilian trucks, now in the early stages of the program authorized late last spring (Assembly Line, May 27, page 66) will continue at slightly better levels during the first half of 1944. WPB has authorized output of 33,852 trucks and 14,067 trailers for 1944 output, most of which will be manufactured during the first half of the year. Indications are that supplemental authorizations will come later to bring the year's total at least to the level of 79,625 trucks reported as necessary by the ODT.

The first release of manufacturing provides for 5,282 trucks of 16,000 to 21,999 pounds gross vehicle weight, 630 from 22,000 to 26,999 g.v.w., and 5,081 of 27,000 g.v.w. and upward, making a total of 10,993 units in the heavy classification. Also provided are 22,859 in the medium weight brackets. Additionally, there will be

As EASY-TO-USE as a snap gage . . .

But with *Electrolimit Accuracy*

YOUR operators can check right down to the fourth place after the decimal . . . fast, positively, *easily* . . . with the Pratt & Whitney Electrolimit Snap Gage. This is the portable version of the famous P&W Electrolimit Gage, flexibly mounted for use where it's easier to take the gage to the work than to take the work to the gage. Set with a master, they register variations from the established zero with easily-read magnifications up to 20,000 times. No possibility of "feel" errors . . . these are snap gages *plus* geared to present and future inspection requirements.



AT THE MACHINE, operator checks his work as he goes along, easily, accurately, with P&W Electrolimit Snap Gage. The work: supercharger shaft of an aircraft engine . . . a close-limits job.

AT THE INSPECTION STATION, with the same fast, high-precision gage, inspector checks again. No "feel" errors . . . minimum of fatigue.

PROMPT DELIVERY

Increased production capacity now lets Pratt & Whitney promise *far better deliveries* than you'd expect. Place priority-rated orders *now* . . . you'll have Electrolimit Snap Gages in time to give a big boost to the jobs you have *already started.* Full details on request. Address our nearest branch office, or contact our headquarters . . . Pratt & Whitney, *Division* Niles-Bement-Pond Company, West Hartford, Conn.

PRATT & WHITNEY

Division Niles-Bement-Pond Company

WEST HARTFORD • CONNECTICUT

There is no better paying investment than the right tools for the job.

1,500 off-the-highway trucks produced.

Quotas between manufacturing companies are now in process of compilation; they probably will not be announced for some little time.

Trailers include types and sizes for motor freight lines, agriculture and other essential industries. There will be included petroleum tanks ranging in capacity from 3,000 to 6,000 gal., and milk tanks of 2,000 to 4,000 gal., and light, medium and heavy pole trailers.

The substantial trailer program will call for fairly good tonnage of medium gauges of sheets, particularly for the tank units. With sheets in the tight position which seems developing, there appears fair grounds for questioning whether completion of the program will be possible.

ODT, meanwhile, is moving to alleviate the short supply of trucks in retailer hands today by putting official weight behind efforts to put such equipment where it is most needed.

PURCHASE of outstanding shareholdings of General Motors Truck and Coach Manufacturing Co. by General Motors Corp., previously a majority stock owner, calls attention to another phase of the truck picture, the drift of emphasis toward heavier units.

Production of trucks rated at less than one and a half tons accounted for 44 per cent of production in 1937, 42.5 per cent in 1938 and 42.5 per cent in 1939. By way of contrast in 1930, 1931 and 1932 the proportions were respectively 29.2, 26.3 and 32.9 per cent. Most of these gains in the latter portion of the decade were sliced off the one and one-half or two ton classification, the medium truck range. At the same time there was somewhat augmented building after 1937 of trucks of five-ton and greater capacity.

The logical reason why General Motors would seek to complete its holdings in GMC would be the probability of increased profits. Profits for this company have risen since the war began, and heavy truck demand is apt to continue strong well after the war.

The job of rehabilitation in Europe and the rest of the world will obviously require heavy prime movers of great variety.

One situation growing out of the war which should be mentioned has been the increase in four and six-wheel drive vehicles. Devices may appear which will make possible connection and disconnection of extra driving axles, and elimination at the same time of much of the equipment hitherto required for such flexibility. Should this come to pass, so the multi-wheel drive can function like a lighter truck when needed, the field may be considerably enlarged for the heavy duty vehicles if original costs of such equipment can also be pulled down.

HELLCAT: The Navy's newest fighter plane shown on the take-off during a demonstration in New York. Built by Grumman, the Hellcat's speed and climb are secret.

Gray Iron Founders Will Meet Oct. 5-6

• • • **The fifteenth** annual conference of the Gray Iron Founders' Society, to be held in Cincinnati Oct. 5 and 6, promises to be constructive. The program is pointed toward a realistic analysis of the gray iron industry's problems of manpower, costs and prices.

The post-war possibilities of the industry, when competition is expected to be exceedingly keen, will also be highlighted at the meeting.

Brig. Gen. William C. Rose, chief of the executive services of the WMC, will discuss manpower, possibly indicating how gray iron foundries may fare under federal plans in the mill, and Dr. Leo Wolman of Columbia University, economist and writer on labor relations, will re-emphasize the labor problem.

"After the War" markets will be discussed by D. H. Davenport, chief, employment and occupational outlook branch, Bureau of Labor Statistics.

Subjects for discussion at the management efficiency forum, scheduled for the morning of Oct. 5, are capital investment, maintenance of equipment, good housekeeping, and the savings to be effected in cupola operation. The subject of gray iron markets, how to develop them through advertising and direct selling will be discussed in the afternoon at a castings sales forum.

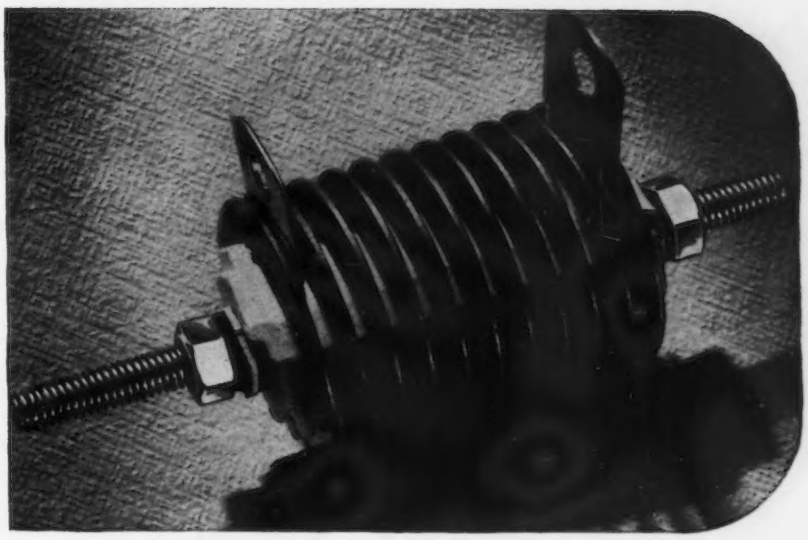
A. C. Denison, president of the Society, will open the general session of the conference at 9:30 a.m. Oct. 6 and introduce as the first speaker of the day John L. Carter, the association's cost consultant. The convention will open its annual business meeting in the afternoon at which reports of the president, executive vice-president W. W. Rose, the treasurer and nine national committees.

Striking Cranemen Tie Up Production At Ford Plant

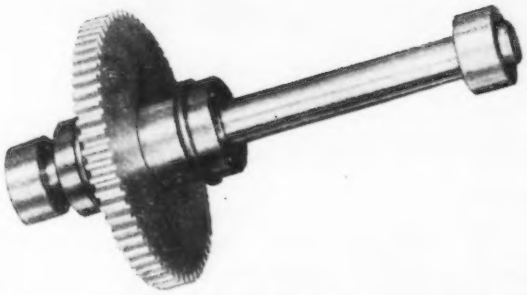
Detroit

• • • **A dispute** over the duties and pay of crane hookers resulted in a walkout of 23 hookers and 21 crane operators at the pressed steel department building of the Ford Motor Co. Rouge plant Sept. 10, leaving the building entirely without crane service for two hr. and curtailing production of parts for war automotive equipment. Production was resumed when the hookers were replaced by riggers and the operators returned to work.

This Stainless Strip is easy to bend — and is ideal for products like resistor units, where temperature changes must not affect the metal's electrical characteristics.



How you can take advantage of Carpenter's experience with Stainless Steel . . .

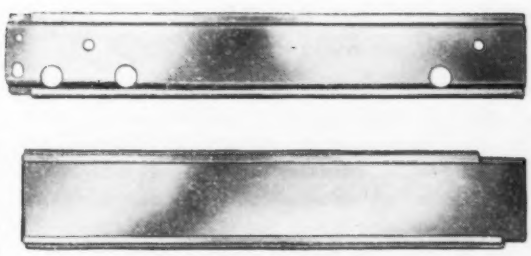


Constant uniformity *from lot to lot — plus unusually close Stainless bar tolerances — helped one manufacturer turn this specialty war product into a mass production item.*

From your engineering department to final inspection floor, Carpenter can help you lick tough problems involving Stainless Steel.

In the shop, your nearby Carpenter representative can often offer suggestions to help you speed output, reduce rejects and cut scrap loss. He can provide useful information on fabricating operations and the properties provided by various types of Stainless.

And for cooperation in working out your product-design problems, get in touch with Carpenter's Metallurgical Department. Add our many years of experience with Stainless problems to your design-engineering knowledge — and together we can work out the solution.



Severe bending, *forming and punching can be done faster when uniformly annealed Carpenter Stainless Strip is used for parts like this radio slide channel.*

Here are Fabricating Helps and Design-Engineering Data

Ask for your copy of this cross-indexed working data book. It is free to Stainless users in the U. S. A. and can really help you find *quick* answers to your questions about Stainless Steels for:

- √ *Special Corrosion Resistance*
- √ *Highest Tensile Strength*
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This book also contains a helpful 24-page Fabricating Section, Glossary of Terms, Tables, etc. For your copy of "Working Data for Carpenter Stainless Steels", drop us a note on your company letterhead.

The Carpenter Steel Company • 121 Bern Street, Reading, Penna.

Carpenter STAINLESS STEELS

BRANCHES AT Chicago, Cleveland, Detroit, Hartford, St. Louis, Indianapolis, New York, Philadelphia

Washington . . .

L. W. MOFFETT

• Key Washington officials returning to private industry cast shadow on WPB efficiency . . . Reconversion plans to civilian production seriously hindered.

WASHINGTON—Though WPB plans to assist in the reconversion of industry to civilian production when the European war is ended, the plans may be very difficult to put into effect.

The reason is, according to WPB spokesmen, key production executives are resigning by the score to return to industry. Fear is felt that the Italian surrender will cause a greater decampment. WPB says that it requires the continued service of men with know-how to direct it successfully in the war's next phase.

Though little has been said about the need for a revitalized WPB at mid-war, it is clear that a referee is going to be necessary to decide what industries should be awakened first from war-enforced sleep. Resigning officials are being urged to remain and do a bigger job for WPB than they would be able to by returning to their companies and working on their individual reconversion problems.

WPB assumes, of course, that the war in Europe will end before the war in the Pacific, which will reduce munitions output, thereby freeing materials which can be devoted to civilian purposes.

Not only are industrialists leaving Washington in alarming numbers, but business men in the production centers are refusing WPB requests to come to Washington to replace those who cannot be dissuaded from leaving, high officials say.

WPB is not worried about minor officials who leave. The fact is that WPB has whittled away at some of its less essential activities so that approximately 5000 employees have left the agency since Jan. 1.

The trouble is that not all those who are gone occupied lesser positions. Too high a percentage have been industrialists who have gained enough Washington experience to make them practically invaluable.

THE day is not in the too distant future when WPB will be required to decide the relative priority among civilian industries for materials, machinery and manpower released by the armed services. Otherwise, unchecked competition for these production necessities might result in less essential industries getting to suppliers first with their orders to the detriment of industries which deserve first priority such as the railroads and public utilities.

While preliminary studies have been made, and continue to be made of reconversion, only the surface has been touched, WPB officials admit. Consequently if the exit of more important business men doesn't stop, it is prophesied that there will not be enough men with the right kind of industry experience to complete drafting plans for reconversion—much less carry them out. Chairman Donald M. Nelson had a study made a few months ago by Ernest Kanzler, Universal Credit Co. executive. Now the Statistical Division is collecting data to form a basis for reconversion plans.

When important men leave, their duties are frequently neglected because replacements are difficult to secure. It follows that minor employees are soon stranded without work—with no one to make the wheels go around.

The empty desks of division after division, and those where employees merely are sitting are a scandal which will not be long ignored by economy-bent Congressional committees. There is no way of telling whether the empty desks are caused by wilful absenteeism of employees whose morale has been lowered by the disintegration of WPB, whether they are the desks of those who have resigned, or the desks of those who have been dismissed. In quite a few offices, not 25 per cent of the employees are at work at their desks on any day.

Arguments for the retention of men important to the war are not

EXECUTIVE DIRECTOR OF OEW: Laughlin Currie, administrative assistant to President Roosevelt, has been loaned by the White House to the OEW as executive director.

arguments for more bureaucracy. Although WPB probably is overstaffed, it is seeking quality personnel and not more. There are about 17,000 employees left out of a high of 22,000 employed on Jan. 1.

The breaking up of WPB has to be stopped by the intelligence of new recruits from industry who can bring life to the dying organization. These must be men who are thoroughly conscious that they are contributing vitally to victory and to an orderly transition to a prosperous peace.

WPB knows that convincing business men to remain in Washington when industry is teeming with marketing schemes for mid-war is tough enough when the desire to return is for this reason alone.

But as one business man recently put it—"I have been in Washington for a year and a half. A year and a half in Washington is about equal to two hours on Guadalcanal. That is about all I can stand at my age."

THE unpleasantness of working and living in the capital forms a tougher and almost insurmountable barrier against the acceptance of any reason for remaining.

Nerves are shattered. Resistance is disorganized. The constant frustration caused by bickering, jealousies, and political smears breaks down morale.

Acceptance Proves Value

HEARTH PATCH is a war-born refractory that has made good.

Open hearth men, driving furnaces for more and more steel to meet war needs, called for an emergency patch material . . . something that could be dumped into large bottom holes to make strong, safe repairs with minimum loss of time. Hearth Patch was the answer.

Just how well Hearth Patch serves this purpose is demonstrated by its steadily growing acceptance. Month after month, the tonnage used increases. New customers are trying it, liking it, becoming regular users.

Hearth Patch is designed solely for emergency repairs. A fine-grained, fast-setting magnesite, it is intended to be thrown quickly, without slag addition, into deep holes while the furnace is still very hot. Thus properly applied and given a working surface of dolomite clinker, it consolidates into a dense repair. At the end of a campaign, such patches should be dug out and replaced with more permanent repairs of Ramix.

Our Service Engineers are prepared to assist your personnel in proper ways to use Hearth Patch and other Basic Refractories products—to help you make maximum savings in production time with good refractories.

BASIC REFRACTORIES, INCORPORATED

CLEVELAND, OHIO

Dollar-a-year men who almost never took a pill before they came to Washington are taking all sorts of treatments, and consulting the soothsayers.

Sleepless nights are almost a universal experience. The doctors in the production cities to which these men have returned are no less aware of the wartime disease "governmentitis" than those medical men here who have been beseiged with a thousand and one complaints, according to reports.

One victim thinks he has a rare and unknown skin disease. Digestive disorders are common. A susceptibility to colds never before experienced by many is blamed on the Washington climate and overcrowding. Physicians say upset nervous systems lower resistance to germs.

Pulse counting, chain smoking, and smoker's throat are a tribute to the artificial tension of Washington living. Many a man maintains a miniature apothecary shop in his top desk drawer.

It would be false to say "governmentitis" only attacks the higher-ups. Employees and officials down the line are no less affected by the feverish tempo which paradoxically may be generated by days of doing little or nothing.

ECONOMIC RULER FOR ITALY: Calvin B. Baldwin, Virginia businessman who has been administrator of FSA since 1940, has been named by Secretary of State Cordell Hull as Director of Economic Operations for Italy, when it is occupied by the Allied Armies.

These employees reflect the nervousness of their superiors. The sedentary, "wait in line for everything" life riddled with intramural politics takes its toll. Daily, rumors come to employees that their jobs are going to be abolished. Therefore, a large number of the rank and file wish they had never seen Washington.

IN spite of these hazards, WPB's war job must be finished and reconversion must be begun. WPB must survey the need for materials, find out how much material in process remains to manufacture civilian goods, discover the industrial capacity and the available manpower. Finally, it must make an analysis of markets to learn what the demand is for the various articles producers may be asked to make again.

To call a halt to the WPB crack-up, business men who possibly can should remain. If "governmentitis" is an incurable disease, then more capable business men should come to Washington to relieve their suffering colleagues. If business does not come to the rescue of WPB when some of the biggest problems are ahead, a period of confusion faces civilian manufacturers when the war in Europe ceases. A period of inefficiency in its wartime duty of material distribution is inevitable, many officials believe.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

DAN DOESN'T GET AROUND SO MUCH NOW-- YOU KNOW, NINETY-TWO IS GETTING UP THERE!
OH, DAN'S GOT A LOT LEFT IN HIM YET! WHY, YOU DON'T LOOK A DAY OLDER THAN WHEN YOU RETIRED FROM THE SHOP!
I DON'T KNOW IF THAT'S A COMPLIMENT OR AN EFFORT TO GET OLD DAN BACK INTO TH' SHOP--I'M MIGHTY SUSPICIOUS, EVEN AT NINETY-TWO!
I GUESS HE THINKS DAN WOULD BE BETTER THAN SOME HE HAS TO PUT UP WITH!
"ENGINEERING"
T. M. REG. U. S. PAT. OFF.
COPR. 1943 BY NEA SERVICE, INC.
J.R.WILLIAMS
9-17

Parts and Components On Frozen Schedules

Washington

• • • **Parts of a product** which is subject to a frozen schedule, are also subject to the schedule if the parts as well as the entire products are made by the same producer, WPB ruled Friday with the amendment of Priorities Regulation No. 18. This ruling also applies to parts of a component.

This means that a producer may not interfere with the production, delivery, or shipping schedule of products, components of products, or parts of either when the products or components are subject to frozen schedules, unless WPB specifically grants the producer permission to do so through issuance of an amendment to the frozen schedule.

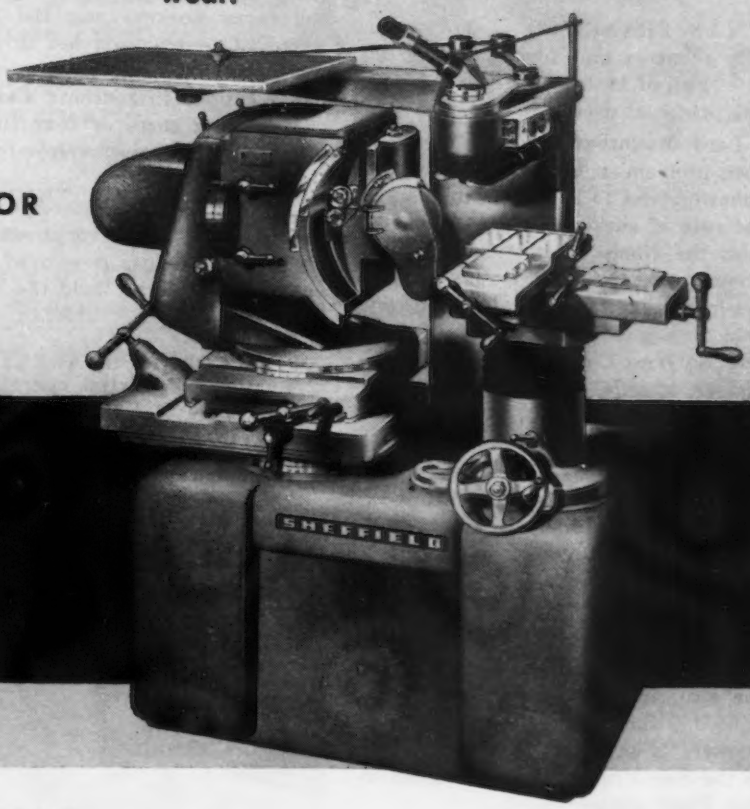
Schedules which are automatically frozen enjoy the same protection under the new regulation as other frozen schedules. However, an amendment to a frozen schedule need not identify the schedule if it has not been filed with WPB.

GRIND PRECISION FORM TOOLS DIRECTLY FROM THE DRAWING to an accuracy of .0003"

SHEFFIELD MICRO-FORM GRINDER

With Pantograph and Microscope

- Finish grinds circular or flat form tools, templates, profile gages, dies, etc., from cemented carbides and hardened steels.
- Grinding time, especially on intricate profiles, reduced as much as 50-75% compared with other methods.
- NO TEMPLATES NOR MASTERS NEEDED.
- Rake and clearance angles developed with the profile—no complicated calculations necessary.
- Accuracy not affected by wheel wear.



THE MOST MODERN UNIVERSAL FORM GRINDER MADE IN AMERICA

Write for full details Bulletins M-120-143

ARMY E NAVY

THE SHEFFIELD CORPORATION

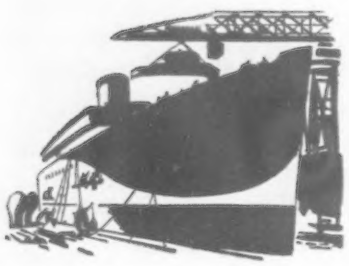
Dayton 1, Ohio, U.S.A.

SHEFFIELD MASTER CRAFTSMEN

MACHINE TOOLS—GAGES—MEASURING INSTRUMENTS—CONTRACT SERVICES

WEST COAST . . . OSGOOD MURDOCK

• Substantial Boeing wage increases by reclassification comfort Seattle's manpower pains but threaten new aches elsewhere . . . For the best woman's weld, 1000 pints of blood.



SAN FRANCISCO — To various theatres and foyers of war the Fall of 1943 seems to bring various principal problems.

Lord Mountbatten faces the monsoon problem in Burma; General Eisenhower tries to keep his forces up to the rate of surrender of his antagonists; the Nazis try to hold a rubber front and keep behind it; East Coasters must resist the temptation to joyride on a gallon and a half of gasoline; so West Coasters suffer the pernicious anemia of manpower in reverse.

What used to be a shortage principally suffered by service wives has become the unanswered question at the top of the problem list of every employer and all officials struggling with the civilian aspects of the war effort in the far West.

In the Puget Sound area centered at Seattle the showdown has come and the situation is perhaps further advanced, although the actual dearth of workers is probably no greater than in the San Francisco, Los Angeles or San Diego areas.

After a month's citywide drive sincerely and earnestly waged by the Chamber of Commerce, the newspapers and the local radio stations, to increase Boeing's working force by 9000, on penalty of losing other contracts and moving other industry away, the discouraging and disheartening result was a net loss of 800 on the Boeing payroll. Having explored and exhausted the possibilities of sentiment and public spirit to no avail, a persuasive financial incentive has been authorized by the War Labor Board. Instead of a contract hiring rate of 67c. it will hereafter be 82½c. and top skill workers will receive $1.65 instead of $1.35 per hour. Respective shift premiums of 10 and 15 per cent for the night shifts instead of the old inadequate 6c. an hour were also authorized. It has been estimated that approximately 75 per cent of workers will get some increase and that the new approved rates are equal to the highest in the area for comparable jobs.

While the considerable adjustments may be expected to help the Boeing situation, it is sure to increase the restiveness and difficulties for the loggers, the pulp suppliers, the miners, the farm workers and the aircraft parts subcontractors, not to mention the business agents for aircraft union organizations in southern California, representing three or four times the number of workers employed by Boeing.

To keep the game going and maintain steadily increasing aircraft production schedules, it proved practically impossible to "hold the line."

A NUMBER of interesting and significant side skirmishes occurred during the battle to maintain Boeing's production army. Before the announcement of WLB's wage increase, War Manpower Commission has directed Puget Sound shipyards to release 14,000 workers from payrolls before Sept. 15. This is roughly a 10 per cent cut and theoretically would supply the entire aircraft deficit. One yard immediately laid off 1500, principally women and Negroes. Production didn't fall off a bit which would indicate that either the yard was overmanned or that increasing familiarity and ability can maintain production with steadily decreasing personnel.

Another yard dropped 4000 without difficulty or disaster.

On another tack, Army Ordnance is urging its contractors in the Seattle area to move all or part of their operations or surrender all or part of their contracts. One big industrial plant working on Ordnance contracts has preferred to substitute Boeing sub-assemblies rather than consider moving or disturbing established facilities.

Another Ordnance contractor is reported unable to move present contracts for some $10,000,000 but willing

WEST COAST FOUNDRY: Columbia Steel Co. officials report the completion and partial operation of their new DPC financed foundry near Pittsburg, Cal. Some undelivered equipment and manpower shortages are holding up full production at present. Annual capacity will be 30,000 tons of steel castings. Facilities include two 25-ton basic open hearth furnaces and a six-ton electric furnace which is yet to be delivered. Columbia will operate for DPC. This is a view of a huge shakeout machine which removes sand and other foreign material from castings by vibration.

1944

None too soon to consider the business of peace

While your post-war products are still in the test tube or in the proving ground of war, is a good time to anticipate Titan service. You'll find it a friendly, personalized service based upon over a quarter century of experience in applying advanced metallurgy and craftsmanship-like manufacture to the non-ferrous metal requirements of some of the greatest names in Industry. Titan research facilities and engineering skill are available to you now. Why not look ahead to the business of peace, with Titan?

Titan

METAL MANUFACTURING CO.

BELLEFONTE, PA.

Quality Alloys by Brass Specialists

BRASS AND BRONZE RODS

FORGINGS, DIE CASTINGS

WELDING RODS

to consider anything or any location on the basis of future additional contracts. A probable compromise will involve removing final assembly lines and continuing full use of installed machine tool, forging and foundry facilities. What may relieve manpower may complicate transportation, but let that be a problem for the Spring or another Fall.

LIKE the "man who came to dinner" and still had the last word at the end of the third act, the Pacific Coast shipbuilding stabilization conference met soon after July 1, supposedly for four days, and seven weeks later recessed until Nov. 1 to reconvene at Seattle. There were some 400 delegates and invited auditors and the working committees included 50 representatives of labor, management and government, all under the able, experienced and cagy chairmanship of Paul R. Porter, the patient architect of the master agreements for both shipbuilding and aircraft.

As nearly as can be determined from the rosy and promising general summaries issued by the official press committee, several arduously negotiated changes in classification have been made, and in exchange labor has granted jurisdictional latitudes which will allow an occasional pipe fitter to poach on the sacred prerogatives of a boiler maker, all in the interest of getting the work out and keeping everybody reasonably busy to the extent of his ability. It is even suggested officially that $70,000,000 a year will be saved to the government by producing the same results with 50,000,000 less manhours per year at $1.40 each.

Another Deferment for Coast Plane Workers

New York

• • • The first step toward conformance with James F. Byrnes' edict of last week placing the West Coast under a labor priorities plan, similar to the Buffalo Referral Hiring Plan, and toward carrying out some of the recommendations of the new Baruch-Hancock report on West Coast labor conditions, was taken when Selective Service declared another 60-day blanket draft deferment for all aircraft production workers in the area. Announced over the week-end, the Baruch-Hancock recommendations were essentially as follows: (1.) Better labor utilization; (2.)wage incentives; (3.) a decision by government between getting (a) more efficient production (b) curtailing some phases of war production (c) limiting civilian non-essential item production further; (4.) priority system of hiring control; (5.) that production necessity and labor priority ratings be tied closely. Practically all these recommendations will be included in the priority hiring system being established at present.

FIRST came a woman welder, then a woman leaderman welder, then contests for the most feet of perfect weld within a given time, then steady and persistent welding "style-shows" and pure publicity stunts. But the inter-city and inter-yard lady welding contest to be decided at the Oakland Civic Auditorium Sept. 28 will be on a bigger scale and more significant than anything hitherto.

One thousand pints of good red shipbuilders blood are the stake. If Mrs. Edna Slocum, 34-year-old housewife and mother of two children, representing Moore's Oakland shipyards is the winner, the Red Cross Blood Bank will gain by 1000 pints of blood from Kaiser's Richmond shipbuilders. On the other hand, if Miss Cora Lee Clonts, the Joan of Arc welder from Richmond, is judged more perfect in her artistry with the rod, the 1000 pints will flow from Moore veins. As a side bet, General Manager Clay Bedford for Kaiser has wagered a pint of royal blue blood with Joseph Moore, Jr., to be personally contributed.

. . . Cited for Awards . . .

• • • The following companies have recently been awarded the Army-Navy "E" award for excellence in war production:

United States Pipe & Foundry Co., North Birmingham, Ala., Works.
Pacific Gear & Tool Works, San Francisco Plant.
Silent Hoist Winch & Crane Co., Brooklyn (renewal star).
Summerill Tubing Co., Bridgeport, Pa. (renewal star).
Jones & Laughlin Steel Corp., Aliquippa Works, Aliquippa, Pa. (renewal star).
Fidelity Machine Co., Philadelphia (renewal star).
Bendix Aviation Corp., Owosso Division, Mich.
Burlington Mills, Inc., Burlington, Wis.
Callite Tungsten Corp., Union City, N. J.
Chicago Transformer Corp., Chicago.
Chromium Corp. of America, Cleveland Plant.
Dellenbarger Machine Co., Philadelphia.
Douglas Aircraft Co., Inc., Long Beach Plant, Cal.
LaSalle Steel Co., Hammond Plant, Ind.
Link-Belt Co., Caldwell Plant, Chicago.
New England Brass Co., Taunton, Mass.
Scientific Radio Products Co., Council Bluffs, Iowa.
Surrey Engineering Co., Long Island City, N. Y.
Thomas Truck & Caster Co., Keokuk, Iowa.

Maritime "M" Commission

Mercer Tube & Mfg. Co., Sharon, Pa. (second gold star).
Republic Steel Corp., Cleveland District.
Edward Valve & Mfg. Co., East Chicago, Ind. (second gold star).
Buckeye Iron & Brass Works, Dayton, Ohio (second gold star).
Columbia Steel Co., Pittsburg, Cal. (second gold star).
Colyin-Slocum Boats, Inc., New York (second gold star).
Dri-Steam Products, Inc., New York (second gold star).
Edwards & Co., Inc., Norwalk, Conn. (second gold star).
Fort Pitt Steel Castings Co., McKeesport, Pa. (second gold star).
Hesse-Ersted Iron Works, Inc., Portland, Ore. (second gold star).
Iron Fireman Mfg. Co., Portland, Ore. (second gold star).
Lewis Bolt & Nut Co., Minneapolis (second gold star).
John Lucas & Co., Inc., Philadelphia (second gold star).
Maine Steel, Inc., South Portland, Me. (second gold star).
Mine Safety Appliances Co., Pittsburgh (second gold star).
Paxton Mitchell Co., Pittsburgh (second gold star).
Pitcairn Co., Barberton, Ohio (second gold star).
Sterling Steel Foundry Co., Braddock, Pa. (second gold star).
Sumner Iron Works, Everett, Wash. (second gold star).
Turl Iron & Car Co., Inc., Newburgh, N. Y. (second gold star).
Union Steam Pump Co., Battle Creek, Mich. (second gold star).
Kelvin & Wilfrid O. White Co., Boston (second gold star).
Bethlehem-Sparrows Point Shipyard, Inc., Sparrows Point, Md. (gold star).
Consolidated Steel Corp., Ltd., Los Angeles (gold star).
Federal Shipbuilding & Dry Dock Co., Kearny, N. J. (gold star).
Kaiser Company, Inc., Portland, Ore. (gold star).
Pennsylvania Shipyards, Inc., Beaumont, Texas (gold star).
Sun Shipbuilding & Dry Dock Co., Chester, Pa. (gold star).
Froemming Brothers, Inc., Milwaukee.
Southeastern Shipbuilding Corp., Savannah, Ga.
Bethlehem Steel Co., Lackawanna Mill, Bethlehem, Pa.
Devoe & Raynolds Co., Inc., New York.
Inland Steel Co., Chicago Mill, Chicago.
Jones & Laughlin Steel Corp., Pittsburgh Mill, Pittsburgh.
Worthington Pump & Machinery Corp., Harrison, N. J.
Youngstown Sheet & Tube Co., Youngstown, Ohio, Mill, Youngstown, Ohio.

Let the Industry speak of our design ...

REYNOLDS METALS COMPANY
INCORPORATED
FEDERAL RESERVE BANK BUILDING
RICHMOND-VIRGINIA

2500 SOUTH THIRD STREET
LOUISVILLE, KY.

December 17, 1941

Hydropress, Incorporated
277 Madison Avenue
New York, New York

Gentlemen:

I believe you would like to have an expression from us on the 2200 ton horizontal extrusion press which you have supplied for our new plant at Louisville and which, although in operation but a short time, has established itself as being very flexible and efficient.

We have produced tubing as well as solid shapes and bar and have pierced solid billets of hard alloys from which we obtained concentric tubes of the best quality which can be desired.

Our opinion is to the effect that the press is excellently engineered, both from the standpoint of design and workmanship, and in our opinion is the most efficient now available on the market.

Sincerely yours,

J. P. Macauley

J. P. Macauley
Vice President
REYNOLDS METALS COMPANY

HYDROPRESS · INC.

ENGINEERS CONTRACTORS

HYDRAULIC PRESSES · ROLLING MILLS
PUMPS · ACCUMULATORS

570 LEXINGTON AVENUE · NEW YORK · N. Y.

They Itch, Too

• • • We are feeling especially kindly toward the English these days, not just because an English manufacturer writes, "All of us here consider your journal to be at the top of its class," but because we hear that there is a new book in England called "Bureaucracy Gone Mad."

Somehow we had picked up the impression that the English were wearing the hair shirt of wartime regulations with an entire absence of writhings and gripings. Hearing no groans, we had believed that the war had ennobled our blood brothers to an inhuman degree.

While this impression existed our awe and admiration mounted, but so did envy, and affection operated in a reducing atmosphere. But now that we realize it was all a misunderstanding we are again as chummy as two hayfever sufferers.

Our kinship with the English is further enhanced by observing that DeSoutter, the English manufacturer of portable tools, makes proper use, in his advertising, of such Americanisms as "Pass the buck" and "Give us a big hand." Nothing contributes so much to harmony between nations as a common language.

Conversely, nothing is so destructive to international understanding as attaching different meanings to the same term. Therefore, will the English bureau in charge of the proper use of appropriated foreign expressions tell Ngaio Marsh, the English writer of detective stories who has a sizeable audience in this country, that a jitterbug is not necessarily a nervous person. Jittery means nervous, but a jitterbug is a devotee of an energetic kind of dancing.

Miss Marsh should be told, too, that no longer do Americans start most of their sentences with "Gee!" Mistakes like these may have unfortunate consequences when we all sit around a peace table.

He Counted the Hours

• • • As evidence of the way industrial advertising can influence those who sit in high places, we quote from an item that C. S. Baur, your favorite family journal's v.p. and g.m., clipped from the *Manchester Guardian* of July 16, 1924, reporting a speech by Stanley Baldwin, who was prime minister at the time:

> "Well I remember the interest I took in advertising some 35 years ago. There was a wonderful paper called The Iron Age which used to publish week by week advertisements of a hand crane which so fascinated me that I used to count the hours from Saturday to Saturday when I might see what new charms had attached themselves to that crane during the week. It did all the work of a shop without any assistance. It went home at night and put the baby into the cot and brought father home from the saloon. That illustrates how good advertising lingers in the memory . . ."

Stopper

• • • The bird that is its own mother!—*Cone Automatic Machine Co., Ind.*

Lapful of Mocha

> Speaking of postwar developments, I see that there is some talk of a coffee percolator in which hot water will go through the handle instead of through a tube in the middle.
>
> No doubt the handle will be adequately insulated, but this reminds me of the time I was at dinner with a very, very correct family. The hostess passed me a cup of boiling coffee, and in accepting it I touched the redhot percolator. Naturally I jerked my hand away, decanting the coffee in my lap. Involuntarily I voiced an old Navy expression of surprise. A long silence ensued, followed by constrained conversation about the weather. I left soon after.
>
> —*Deac*

China Wants Back Copies

• • • A problem confronting the big public libraries, universities, and government bureaus in the war areas is the maintenance of their files of important foreign technical journals. To help, the American Library Assn. has formed a "Committee on Aid to Libraries in War Areas."

Miss Dorothy J. Comins, of that Committee, says that the files of THE IRON AGE being maintained for the National Geological Survey of China are short the issues from the beginning of January, 1942, to the end of April, 1943. As our own supplies are exhausted, Miss Comins has asked us to publish this plea:

> Any subscriber who is willing to make his copies available to this Chinese library is asked to write to Miss Dorothy Comins, Executive Assistant to the Committee on Aid to Libraries in War Areas, Library of Congress Annex, Study 251, Washington 25, D. C. The Committee will pay the cost of forwarding copies to a storage point in this country where they will be held until they can be shipped abroad.

Aptronym

• • • I notice that a bookstore in the Lincoln Building carries a book on "Gears and Gear Cutting," by F. J. Camm.

—*A. W. M.*

Acetic Acid, Concentrated

• • • H. H. Lurie, chief metallurgist, Cummins Engine Co., Columbus, Ind., thinks we should pass along these mordant definitions he saw in a recent A.S.T.M. bulletin:

> Statistician—a man who draws a mathematically precise line from an unwarranted assumption to a foregone conclusion.
>
> Efficiency expert: a man who knows less about your business than you do and gets paid more for telling you how to run it than you could possibly make out of it even if you ran it right instead of the way he told you to.
>
> Conference—a group of men who individually can do nothing, but as a group can meet and decide that nothing can be done.

Then there is Hendrik Van Loon's remark that a committee of three functions best when one member is absent and another sick.

Three Over, One Shy

• • • Our campaign to have esses dropped wherever they can be safely eliminated has proved a dismal failure. "Materials-handling equipment" is now practically standard usage. A little girl who stood in front of us in a railroad ticket office line said, "Please give me a timestable," and Leon Wesley Moffet, your Washington radar, writes:

> . . . the United States has more men between the ages of 18 and 49 than any country with the *exceptions* of China and India.

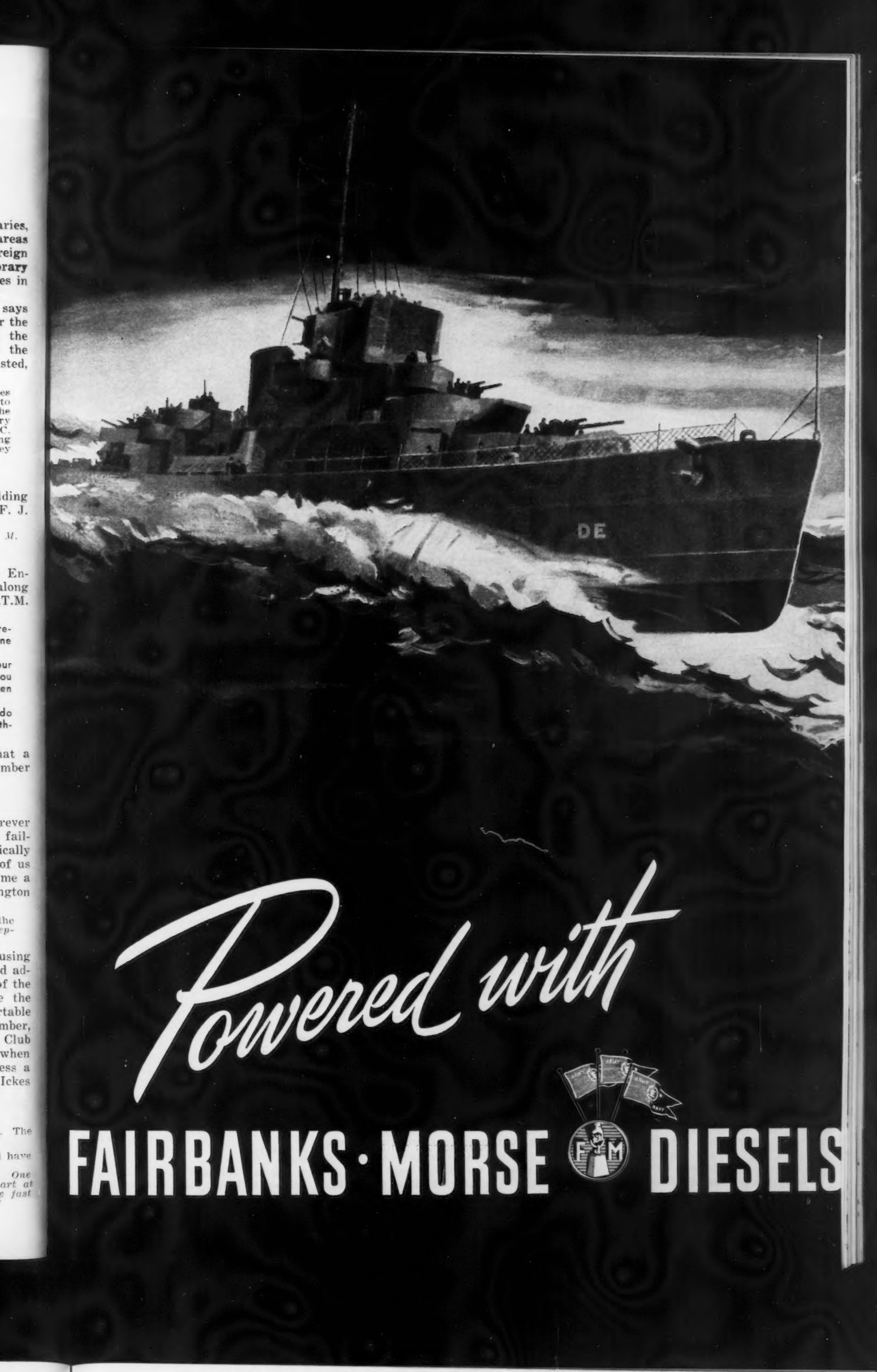
Any of these esses can be amputated without causing bleeding, and one of them could be grafted to good advantage on the next to the last word in the name of the New York Sales Executive Club. In this case the singular is unnatural, and gives the uncomfortable impression that maybe the Club has only one member, like the U. S. Ex-President Assn. Actually, the Club is simply lousy with members, as we found out when we tried to crowd in to hear Harold Ickes address a recent meeting. Like practically everybody else, Ickes referred to it as the "Sales Executives Club."

Puzzle

Last week's pedestrian walked at 4 miles per hour. The trolleys traveled at 10 m.p.h.

To get A for this (sent in by W. P. Kelly) you will have to get the right answer in two minutes or less:

Two hands on a dial travel in opposite directions. One hand travels 17 times as fast as the other. Both start at 1 o'clock on the dial. How many revolutions will the fast hand make before the two hands meet at 7 o'clock?


DE
Powered with
FAIRBANKS·MORSE DIESELS

Dear Editor:

HEAT TREAT DEFINITIONS

Sir:

In your Oct. 1, 1942, issue, a listing of "Heat Treating Terms Defined" appeared. The introductory paragraph states that these definitions have been *proposed* to the American Society of Testing Materials. Can you advise me if these definitions have been adopted?

PHILIP KRIEGEL
Spooner & Kriegel,
50 Church Street,
New York

● Yes, on Sept. 10, 1943.—Ed.

TRAINING FILM

Sir:

We are interested in acquiring a library of 16-mm. sound and silent moving picture films and 35-mm. slide films with or without records for machine shop personnel training purposes.

Will you please give me a list of the better available films.

KNOX A. POWELL,
Research Engineer
Minneapolis-Moline Power Implement Co.,
Minneapolis, Minn.

● Some sources of educational training films are: Bell & Howell, 30 Rockefeller Plaza, New York; Film Production Co., Minneapolis, Minn.; General Electric Co., Schenectady, N. Y.; Cleveland Twist Drill Co., Cleveland, Ohio; Jam Handy Organization, 19 W. 44th St., New York; Burton Holmes Film Co., 7510 Nashland Ave., Chicago; General Motors Corp., 1775 Broadway, New York; Pratt & Whitney, East Hartford, Conn.; and Illinois Institute of Technology, Chicago 16, Ill.

Some of these companies lend their films without cost. Others charge a nominal fee. In still other cases, films must be purchased outright. The Herbert D. Hall Foundation, 1060 Broad St., Newark, N. J., has a useful booklet on training films, entitled, "Visual Aid Catalogue." In it are listed the motion pictures and slide films available for training purposes.—Ed.

WATER SEPARATOR

Sir:

In your Aug. 5 *News Front* is an item concerning a "new concept of physical chemistry" developed by the Selas Co. We would appreciate receiving the address of this company as we are interested in the automatic removal of water from compressed air lines.

R. F. RUSSELL,
Tool Supervisor
American-LaFrance-Foamite Corp.,
Elmira, N. Y.

● Selas Co. is at Erie Ave. west of D Street, Philadelphia.—Ed.

BLAXOL

Sir:

In your Sept. 2 "Dear Editor" page, Mr. Segall inquires for an oxidizing compound called "Blaxol." He may have in mind "Blaxite," sold by the Tobler Chemical Co., Portland, Conn., which I believe to be suitable for the black oxidation of steel surfaces.

HENRY C. BOYNTON,
935 Carteret Avenue,
Trenton, N. J.

PRIVATE ENTERPRISE

Sir:

May I take this opportunity to express my appreciation for the understanding way in which you handled "The Spirit of Enterprise," my first and probably my only, literary venture.

I undertook the job solely because I wanted to make whatever contribution I was capable of making to current American thinking. Our people should realize what they have, which I am afraid they are not only taking too much for granted, but are in danger of losing.

EDGAR MONSANTO QUEENY
1700 S. Second Street,
St. Louis

● Mr. Queeny's comment refers to the July 29 editorial, "A Businessman Writes About Business."—Ed.

GOLD-INDIUM ALLOYS

PLEASE WIRE WHERE WE MAY OBTAIN MORE INFORMATION ON GOLD-INDIUM ALLOYS AS DESCRIBED IN TECHNICAL ARTICLE SEPTEMBER SECOND ISSUE.

F. S. KLACK,
Chief Metallurgist
Hamilton Standard Propellers,
East Hartford, Conn.

● Additional information may be obtained from Indium Corp. of America, 60 East 42nd St., New York. All data in the Sept. 2 article were obtained from a booklet recently issued by the Indium Corp. By error, this credit was not included in the reprint.—Ed.

STITCHING METALS

Sir:

In your Aug. 19 issue, you refer on page 70 to "An Automotive Method of Wire-Stitching Metal Parts Together."

Can you refer us to some manufacturer of machinery of this type?

H. C. HARDING, Supt.
Bldg. & Hwy. Spec. Shop,
Bethlehem Steel Co., Inc.,
Lackawanna, N. Y.

● The machinery is made by Harris-Seybold Potter Co., Dayton, Ohio. For a description of the method, see page 55, May 9, 1940, Iron Age.—Ed.

JOINING METALS WITH ADHESIVES

Sir:

We will appreciate your assistance in obtaining further information on the process for joining light alloys, as described on pages 52-53 of your Aug. 19 issue. This article is of great interest to us.

D. J. WOODWORTH,
Chief Engineer
Lincoln Park Tool & Gage Co.,
1719 Ferris Avenue,
Lincoln Park 25, Mich.

● The development described in the article is still of a laboratory nature. No information has been released, except the English data appearing in the article. More information might be obtained from Aero Research, Ltd., Duxford, Cambridge, England. Goodyear in Akron and DuPont in Wilmington are American manufacturers of adhesives for joining metals, but practically no information is available for publication.—Ed.

HERESITE

Sir:

In your Aug. 26 issue, pages 48-52, you mention a baked-on, corrosion resistant finish called "Hirksite." Where can we obtain further information?

J. ZIMMERMAN,
Lab. Technician
Crane Co.,
836 So. Michigan Avenue,
Chicago

● Our editor's notes of his visit to the Puget Sound Navy Yard read "Hirksite," and the material was attributed to DuPont, but further investigation leads us to believe that the material referred to is Heresite, made by the Heresite & Chemical Co., Manitowoc, Wis. The coating looks like a light porcelain enamel, but is said to be more resistant to chipping.—Ed.

HINGES

Sir:

Do you know of any book or article on sequence of operation of making hinges?

CHAS. A. BUCK
Fairfield Barrel Co.,
4000 Commerce Avenue,
Fairfield, Ala.

● See pages 19-21 in "Punches, Dies and Tools for Manufacturing in Presses," by Woodworth, published by Norman W. Henley Publishing Co., 2 West 45th St., New York.—Ed.

TOOL STEEL DIRECTORY

Sir:

Will you please advise me the possibility of obtaining two copies of your "Directory of Tool Steels."

One copy of this would be used in our Tool Engineering Department, while the second copy is for use in our Purchasing Department.

C. M. FRANKLIN,
Asst. Master Mechanic
Rochester Products Div.,
General Motors Corp.,
Rochester, N. Y.

Sir:

Would it be possible for you to furnish us with a copy of your "Directory of Tool Steels" or advise us where we may obtain one? We have considerable use for this pamphlet and would appreciate your advice.

G. C. STOUFFER
Studebaker Corp.,
South Bend, Ind.

● The new edition is now in preparation and will be ready about Oct. 1.—Ed.

★ Twisting a piece of wire sounds like a simple matter, but actually, in the making of better springs, it is quite a significant operation. By evaluating the results of a twist test, the Muehlhausen spring technician is able to select stock that will withstand the torsional strains to which springs are subjected in use.

In this test, a specimen of wire, held between two chucks of a specially designed laboratory machine, is twisted clockwise and counter-clockwise a predetermined number of times. Weakness is revealed by premature breakage or the opening of hidden seams. Only wire that can withstand the punishment of the twist test is approved for production.

Scores of such tests are conducted daily at Muehlhausen to make sure that every spring leaving this factory will perform with maximum efficiency and long life.

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Die Spring Bulletin illustrates, describes 206 sizes and types of die springs. ● Armament Bulletin shows importance of springs for many types of war equipment.

MUEHLHAUSEN
SPRINGS
EVERY TYPE AND SIZE

This Industrial Week . . .

- **Home Front Tightens as War Opens Up**
- **Production of Steel, Other Items, Strong**
- **Domestic Coal Shortages Becoming Serious**
- **Hopes for More Civilian Steel Are Dimmer**

AS the men, equipment and strategy of the United States and Great Britain encountered their sternest war tests this week against the Germans in Italy, production in America was holding up strongly and large quantities of material were being rushed to the front.

Steel ingot output at 99.5 per cent this week is a decline of one point but the tonnage is the second highest on record, exceeded only by last week's mark. Shipments of Lend-Lease steel, after a short lull are heavy again and probably will remain so through the balance of this year.

The war's new turn will tighten all domestic supply problems, temporarily at least, and will heighten the critical manpower and coal shortages. The pattern of the military supply program will not be altered at this time and therefore there can be little hope for the additional release of steel and other critical materials to the civilian economy.

Italy's capitulation increases the seriousness of the domestic coal crisis, since Italy is dependent on imports of fuel. Already coal is being diverted on a priority basis to metallurgical industrial needs in the U. S., and the shortage can be expected to grow more serious. Many miners have been drafted or lured to other industries while those remaining at their posts are said to be jittery because they are working without a contract. Other factors contributing to the shortage include the effects of this year's numerous mine strikes, absenteeism, exhaustion of coal veins, a falling off in coal mining efficiency at both hand and mechanized mines and the tight transportation problem. By-product coke production has not kept pace with pig iron output and rejections of beehive coke have increased because of poor quality.

THE skirmish at Washington over more steel for civilians still is going on, but it seems increasingly clear that civilian production can only be small at this time. WPB'S latest move toward the protection of the 225,000 tons allotted for consumer goods in fourth quarter is a special directive aimed at insuring distribution of products through normal retail outlets. This is interpreted as an attempt to keep the steel from going to the Army and Navy.

News Highlights in This Issue

War Production to Hold	97	Ingot Output Chart	105
Coal Supply Serious	98	Priorities for Labor	106
Beehive Coke Tightens	100	Component Ruckus	106A
10,000 Machine Open	101	Farm Machine Export	106A
Ingot Stockpiles Urged	101	Civilian Quota Move	106B
Order-Production Charts	102	Renegotiation Hearing	106C
Brazilian Expansion	104	M-311 Revision Talks	106D

Practical steel executives continue to insist that the immediate picture does not contain the slightest indication of any large scale steel distribution to civilian channels. Allotments are meaningless if production facilities are jammed with higher rated orders as they will be until new finishing mills are completed and until the present war crisis eases.

All plate producing facilities of the nation are flooded with heavier orders than ever before due to the step-up in shipbuilding. Sheet and other flat-rolled departments reflect the unprecedented situation, being greatly extended on their backlogs and unable to schedule large tonnages needed for war purposes. WPB is surveying the entire sheet mill situation through first quarter of 1944. It has been difficult to place tonnages needed for a large overseas container-making venture.

RAILROAD carbuilders are assured of their third quarter steel requirements for 6000 freight cars which have been approved, but their chances of getting all fourth quarter material is another story. Even if plates do become available through changes in shipyard needs, the fourth quarter railroad setup calling for around 10,000 domestic freight cars may run into a snag because of bar and sheet shortages.

It is believed that the first and second quarter of next year will see plans for about 10.000 domestic freight cars per quarter. More than 3000 have already been approved for the first quarter of 1944. Chances of completing such a number of units, next year, may be bettered because of new plate mills going into production. Pressure may be off slightly on bars by the second or third quarter next year, *if* the plate situation becomes easier.

The United States War Department has already set up its schedule for thousands of freight cars to be built during the fourth quarter this year, through and including the third quarter of next year. A substantial tonnage of steel will be required in this program. Events abroad have given it a green light; and future developments may find the War Department program "derailing" some of the domestic freight car business.

Steel users faced with very belated deliveries on carbon steel products such as bars have been able to get much quicker deliveries of alloy steel products from some of the smaller alloy steel producers. While there have been reports of alloy steel sold recently at carbon steel prices, as a general practice this is not the case. As far as can be determined, any sales of this type were very limited.

NE Steels, 9400 series, have had their extras for alloy content reduced five cents a hundred pounds. This downward revision was made because of the change in chemical content on Aug. 15.

The Army Ordnance Department now has more than 10,000 machine tools available for transfer to war contractors who need them. The tools have been

Sidelights of This Week's Summary

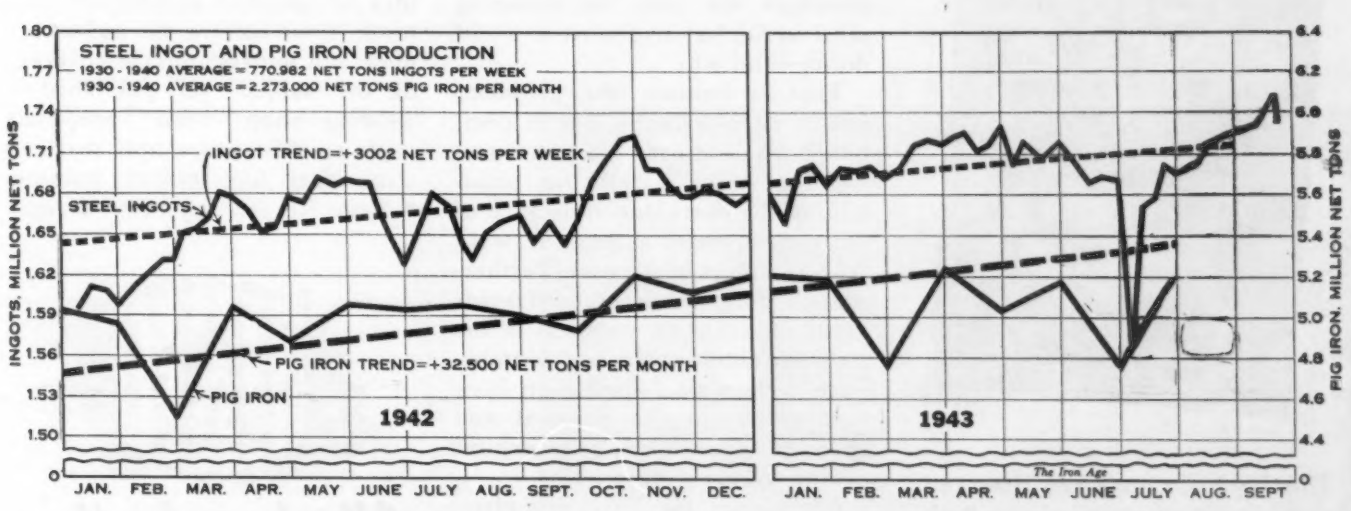
• • • A few electric steel furnaces have been idle recently because of lack of orders. . . One of the inconsistencies in the hectic plate situation is that plenty of ingots could be shipped to an Eastern mill but it cannot process them. . . Scarfers at the Irvin Works in Pittsburgh caused a loss of 8500 tons of plates last week during a two-day dispute. . . Reports of shipyards swinging over to new types of construction are numerous. A few New England yards are now building for the British instead of for the United States Government. Certain West Coast yards are reported winding up the Liberty ship program. . . One Russian plane utilizes waste exhaust gases to provide an inert gas helping protect against fuel tank fires. . . Wider substitution of stress grades of lumber for structural steel is expected as a result of WPB Directive No. 29, which is estimated to increase by 20 per cent the working stresses for all lumber which has been graded for strength. This order is expected to save 200 million board feet of structural timber annually, as well as 2000 tons of metal in the form of connectors, bolts and lag screws. . . Paper, oddly enough, is proving to be the most widespread substitute for sheet steel products used in the home and industry. Former steel products now made of paper include garbage cans, conduit pipe, refrigerator panels, ice cream freezer cans, metal surfaced laminations, hot air ducts. . . Cadmium is among the tightest of all materials currently and WPB has limited its military exemption to those uses required by prime contracts. . . The Steel Division of WPB is starting upon a brave campaign to reduce the paper work of the industry. . . During the first six months of 1944, the U. S. is scheduled to produce over 34,000 trucks and 14,000 trailers for civilian use, in addition to the three-quarters of a million trucks the industry is scheduled to make for the armed forces next year.

declared excess by munitions manufacturers in ordnance districts whose contracts have been cut back or terminated. The fact that a tool is excess to a particular manufacturer does not mean that it is considered surplus by the War Department, a War Department spokesman pointed out.

With deep interest, industrial leaders have been following the course of the hearings in Washington upon the renegotiation law, aspects of which have aroused bitterness. On Tuesday, J. F. Lincoln of the Lincoln Electric Co. challenged claims that renegotiation boards have saved $4,000,000,000, asserting that all but $400,000,000 already had been recaptured by the present tax law. "Even if the amount claimed by the boards has been recovered, it has been lost many times over by the inefficiency forced on industry by renegotiation," said Mr. Lincoln.

CAP and CSP are lively topics at WPB. CAP is Coordinated Authorization Procedure; CSP is the Component Scheduling Plan. CAP is proposed to simplify the priority procedure whereby contractors working on allocations of controlled materials may automatically obtain supplies of critical materials other than controlled materials. This is somewhat along the lines of England's system. In regard to CSP, controversy is rampant at Washington on the plan of WPB to combine the powers of CSP with the component scheduling Order M-293. Ideas behind the merger is to greenlight component production without regard for allotment numbers or preference ratings. WPB officials who do not favor the plan say that indiscriminate production of components may break bottlenecks but at the same time cause material pinches on other products. Also, it is charged that paperwork would be increased. Effect of the change would be to relieve all persons from complying with all or part of at least 11 different WPB orders covering components which come under Order M-293.

CONTRIBUTING to the one-point drop in steel ingot production, operations in Youngstown declined one and a half points to 96 per cent while in Detroit, the rate decreased two and a half points to 100.5 per cent. St. Louis, up three points to 106.5 per cent, is the only district showing an increase in steelmaking. Unchanged from last week are Pittsburgh at 102.5, Chicago at 99, Philadelphia at 93.5, Cleveland at 99.5, Buffalo at 104.5, Wheeling at 100, Birmingham at 102, Cincinnati at 105 and the Eastern district at 97.5 per cent.


STEEL INGOT AND PIG IRON PRODUCTION
1930 - 1940 AVERAGE = 770,982 NET TONS INGOTS PER WEEK
1930 - 1940 AVERAGE = 2,273,000 NET TONS PIG IRON PER MONTH
INGOTS, MILLION NET TONS
PIG IRON, MILLION NET TONS
INGOT TREND=+3002 NET TONS PER WEEK
STEEL INGOTS
PIG IRON TREND=+32,500 NET TONS PER MONTH
PIG IRON
1942
1943
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT
The Iron Age

Steel Ingot Production by Districts and Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
September 9....	102.5	99.0	97.5	93.5	99.5*	104.5	100.0	102.0	103.0	95.0*	105.0	103.5*	97.5	100.5
September 16...	102.5	99.0	96.0	93.5	99.5	104.5	100.0	102.0	100.5	95.0	105.0	106.5	97.5	99.5

* Revised.

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This book can save you time and avoid spoilage of vital alloys, both more than ever essential to the war program today. Describes and illustrates equipment, procedures, precautions. Request copies on your company letterhead, please.

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SUCCESSFUL stainless steel welding, as many a shop has found out the hard way, puts a premium not only on knowing what to do, but also what to avoid doing—and why.

That is because the problem, first of all, is a double one as compared to ordinary carbon steel welding, since it calls for maintaining the corrosion resistance of the parent metal across the weld area, as well as its strength. Furthermore, although stainless steel welds easily, the various members of the stainless family differ considerably from carbon steel—and even from each other—in the physical and chemical phenomena they exhibit during the welding process.

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GENERAL OFFICES: BRACKENRIDGE, PENNA.

A-9078 . . . W&D

U.S. War Production Pattern to Be Kept On Its Course Despite Italy's Foldup

• • • **How will** the armistice with the Badoglio Government of Italy, signed Sept. 3 and announced Sept. 8, affect the trend of war production in the United States?

If anything, it has shown that the German army in Italy still is formidable, and that therefore no letdown can be countenanced on the production front in America, even though the Allies are far ahead of their time table and have not expended equipment at a rate anywhere near expectations.

The pattern of the military supply program will not be altered, according to WPB steel division officials interviewed at Washington by THE IRON AGE staff there over last week-end.

Meanwhile, Secretary Ickes indicated that Italy's need for coal (the nation imported large amounts from Germany) will tighten the shortage of coal in the United States.

WPB men pointed out that since CMP requirements and programs are set for the remainder of the year, no change will be reflected in production because the same type of equipment is needed to fight the Germans as was needed to fight the Italians. It was suggested, however, that there might be a speed up in the manufacture of invasion equipment for the intensification of the war against the Nazis from newly acquired bases in Italy. It was also explained that naturally if the campaign proves the need for improvement in weapons or dictates that certain weapons are obsolescent changes in production will result.

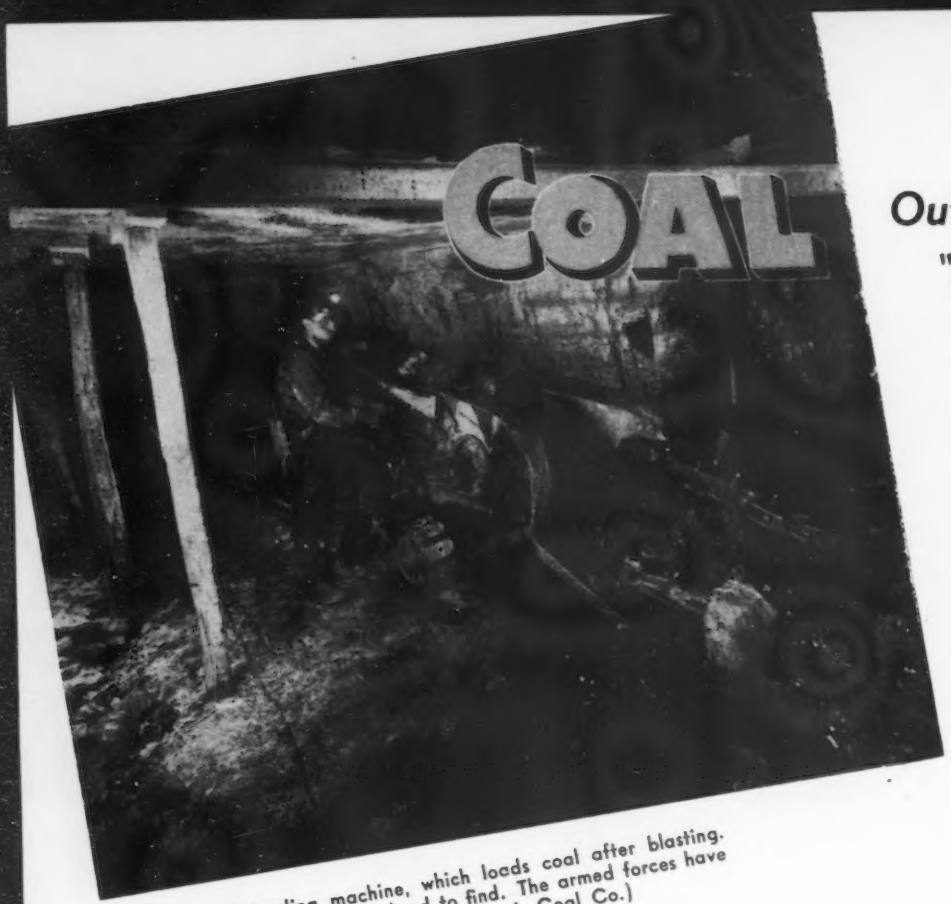
Looking to the day of the inevitable Allied victory, it was said that when Germany is defeated it is probable that the Army and Navy will release materials, machinery and manpower for the manufacture of civilian goods.

Italy's Production in Minerals and Metals, 1938

(Metric Tons) 2204.6

Iron ore	990,043
Lead ore	67,493
Zinc ore	200,848
Iron pyrites	930,312
Bauxite	380,837
Lead	48,418
Pig iron	864,536
Steel ingots & castings	2,307,403
Aluminum	25,767
Metallic mercury	2,301

WAR IS WEIRD, WHAT?: The art editor says these pictures must have come from Hades. At top, British are firing a captured Italian howitzer in the drive on Italy. Center shows Germans burning a Russian village in their retreat. Bottom photo shows Allied parachute bombs dropping among Jap twin-engine ships in New Guinea.



• Mechanized loading machine, which loads coal after blasting. Skilled workers for this job are hard to find. The armed forces have taken many. (Courtesy Pittsburgh Coal Co.)

Output Affected by "Jitters" of Miners; More Restrictions Are a Possibility

o o o

By T. C. CAMPBELL
Pittsburgh Regional Editor

o o o

Uniontown, Pa.

• • • **Absenteeism, manpower shortages,** "no-contract jitters," exhaustion of coal veins, heavy army inductions, and a falling off in tons per man per day efficiency, are a few of the major difficulties besetting Old King Coal as his services urgently are demanded on the war and home fronts.

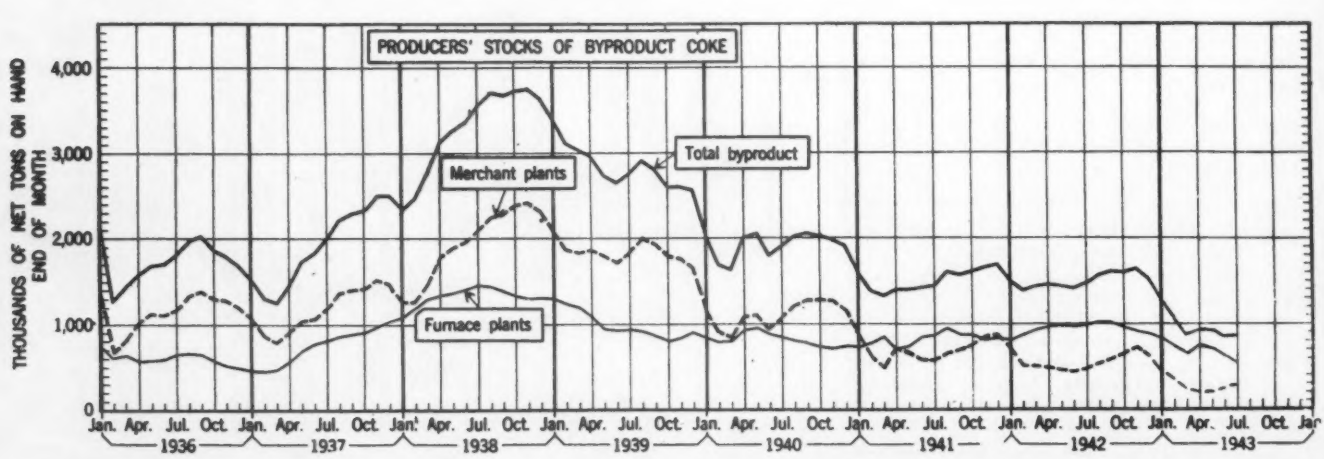
Many of these difficulties cannot be overcome until after the war and, hence, for the next several months at least coal will be the watchword wherever progress at home and abroad is involved. Already coal is being diverted on a priority basis to metallurgical industrial needs, and there are signs that this situation will grow tougher before winter sets in. Domestic coal users in this Western Pennsylvania area must wait from six to eight weeks for their winter coal supplies, in order that sufficient coal may be moved to the Lakes to insure fuel for the northwest.

Industrial users in the east already are feeling the effects of poor coal quality, which has resulted from the mining of coal at locations previously thought to be worked out, or where the coal during normal times was not good enough to satisfy the consumer requirements. All that has changed, as the urgency for more tonnage became tremendous.

Large steel companies with coal mines, although slowly getting back into a better supply position, nevertheless in many instances have not fully recovered from the effects of coal exhaustion. This situation has still made it necessary to divert large tonnages of metallurgical coal over long distances, with its consequent increase in costs. It is believed that if no more strikes ensue this year (and there is no assurance of this) most steel companies with mines on a 42-hr. or a 48-hr. week will be able to build up some supplies. This would insure full utilization of by-product coke ovens.

The overall coal position, however, in the East and Middlewest is by no means encouraging. Before the year is out, Solid Fuels Administrator Ickes probably will have to go much further in conserving coal than was done recently in the order which requires the consumer to indicate inventories before obtaining.

Despite the apparent complexity of the coal situation, the basic reasons for lack of supplies are rather simple.



This year's strikes by no means tell the whole picture. Young, tough, able-bodied miners, who were the big producers at the mines both in hand mining and machine mining, have been drafted by the thousands, and other thousands (before the WMC clamped down) migrated to better paying war jobs.

The series of coal mining strikes this year caused losses in production which probably cannot be made up at many coal mines. The threat of a possible work stoppage between now and Nov. 1 is in the air.

First-hand information from the mine fields in Western Pennsylvania indicates that many miners are suffering "no-contract jitters." There have been no official orders from John L. Lewis to strike or to stop work, but the whole history of the miners, individually and as a group is predicated on "no contract, no work." For the first time in many years, they are now working without a contract because of a "truce" extending to Oct. 31.

This paradox in the miners' lives has had, and will continue to have, many psychological quirks. The fact that the miners have not received a raise while they see unskilled war workers, and semi-skilled employees making from $40 to $70 a week is at the bottom of many manpower difficulties.

Absenteeism is running high in many coal mines, both large and small. No small part of the working crews is content to work four days a week and lay off. Some miners have the idea that to work more than this means that "they are working the extra days for someone else."

It is probably true that the falling off in efficiency, at both the mechanical and hand mines since April, has been due entirely to contract difficulties. Some observers have called this a quiet, unpremeditated slow down. Whether this is true or not, efficiency, expressed in tons of coal per man per day, is definitely in a slump.

Figures from one large Midwest coal company indicate that hand mining efficiency had been increasing steadily during the early part of 1943 over the same months in 1942. This increase continued until the latter part of April, when strike troubles materialized. During the strike period, efficiency dropped sharply. Significant, however, after the first strike in May, is that efficiency skyrocketed in hand mining for at least three or four weeks. This superhuman effort (which incidentally showed what really could be done) probably was due to the fact that most miners were "broke" because of the lay-offs and needed money. Figures indicate that, after this burst of speed, efficiency dropped sharply, and was soon followed by other outlaw strikes in June. Since June, efficiency in the hand mines of this company has leveled out at a lower scale than was the case during the first four months of this year.

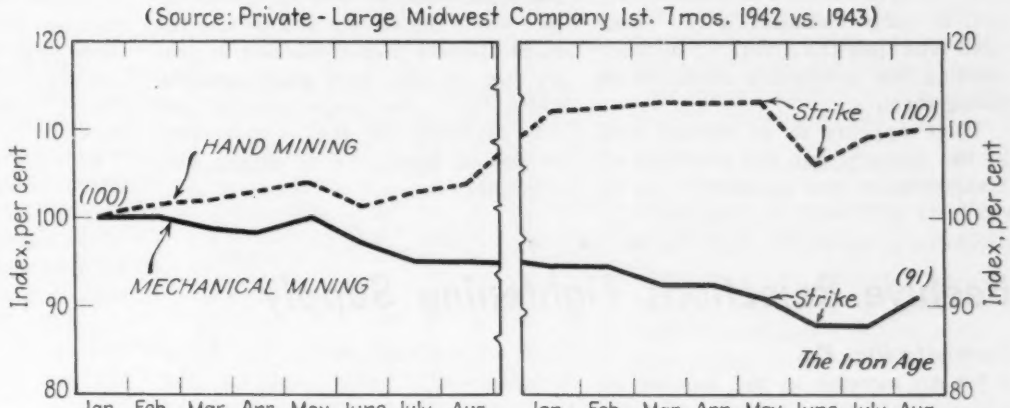
The experience in mechanical mining efficiency in this large coal company has been somewhat different since 1942. The betterment in hand mining output, described above, was due in a large measure to the refinement of an incentive wage plan. Mechanized mine experience, however, has shown a continual drop in tons mined per man per day since January, 1942.

Using January, 1942, as 100, mechanical mine efficiency in August of this year had dropped to 91; a loss of 9 per cent. Not all this loss can be attributed to the mine wage controversy, since the index began to drop early in 1942. Some observers insist that this drop in efficiency is due to a silent slow-up directed against the use of machinery in the mines. This is probably only part of the overall reason. The big producers in mechanized mines were some of the young fellows who either were drafted into the army, enlisted, or went to other war jobs. Mechanical mining is more intricate, and in some ways requires more machinery skill than hand mining; and the recruits which coal companies are now getting, unfortunately, do not measure up to the tonnage ability possessed by their former employees. These conditions probably will be eliminated in the post-war era since machinery has been making rapid strides.

This loss in efficiency during the past several months, at both hand and machine mines, is serious. Regardless of its causes, its effects probably mean the difference between enough coal and a severe shortage. Unfortunately, not too much can be done to alleviate this situation except

TRENDS IN DAILY CLEAN COAL PRODUCTION
HAND AND MECHANICALLY MINED
TONS PER MAN PER DAY
JAN. 1942 = 100

(Source: Private - Large Midwest Company 1st. 7 mos. 1942 vs. 1943)



	1942								1943							
MACHINE	12.30	12.25	12.15	12.10	12.25	12.00	11.75	11.70	11.60	11.65	11.35	11.39	11.21	10.79	10.76	11.15
HAND	7.20	7.30	7.35	7.40	7.50	7.30	7.40	7.50	8.05	8.10	8.15	8.16	8.15	7.64	7.87	7.90

Tons per man per day

• • • Coal already is being shipped from the U. S. to keep Italian utilities, ships, factories, locomotives and other facilities going, said Secretary Ickes last week, emphasizing the seriousness of the growing domestic coal shortage.

Ickes also revealed last week that 549 coal mines have been returned to their owners, leaving 2829 still under government control.

distributing available coal to places where it is needed most. The necessity for shipping coal to Italy will complicate the picture somewhat. It is not now a matter of millions of tons which are needed here and there, but, in many instances, a few thousand tons spell the difference between meeting war production schedules or losing them.

There appears to be enough coal in the country, but the problems of transportation and manpower are so tremendous that such coal cannot always be obtained by those who need it.

Because of the manpower problems and because of the tremendous demand for coal, as well as the situation which the miners find themselves in, it appears that production is proceeding at the best rate possible, which leaves the major part of the coal problem, for the next several months at least, one of proper distribution.

o o o

Beehive Rejections Tightening Supply

Connellsville, Pa.

• • • **An increase in** the number of rejections of beehive coke, due to quality reasons, has further tightened the entire coke picture. With steel mills in many instances short of coke, because by-product production has not kept pace with pig iron output, the drop in beehive supplies may have further repercussions later in the year.

The manpower situation and high absentee rate at some smaller beehive coke plants is also a cause of trouble.

As reported before, the coke region here has seen the exhaustion of most coal mines, which were originally situated next to the ovens, and many coke plants now must haul their coal distances ranging from 15 to 25 miles. Some of the best coking coal mines are practically worked out, and the coal coming from them to the coke plants now constitute a material which in normal times would not be used by the coke operator or accepted by the customer.

In the last few months the increase in beehive coke per ton of pig iron produced has reached the point where blast furnace operators have turned down coke in ever increasing quantities. Some observers believe that had this attitude been reflected earlier in the year, government action toward bringing remote coal in might have been expedited. The responsibility for the quality problems rests upon no one individual or any particular group.

Hand drawn coke plants this week were in the midst of a serious manpower shortage and growing absentee rate. One hand drawn coke plant near Uniontown, with 103 available ovens but only 69 operating, because men are not available, was unable in three days to have 22 ovens pulled. A year ago, this same plant was operating 102 ovens and losing practically none.

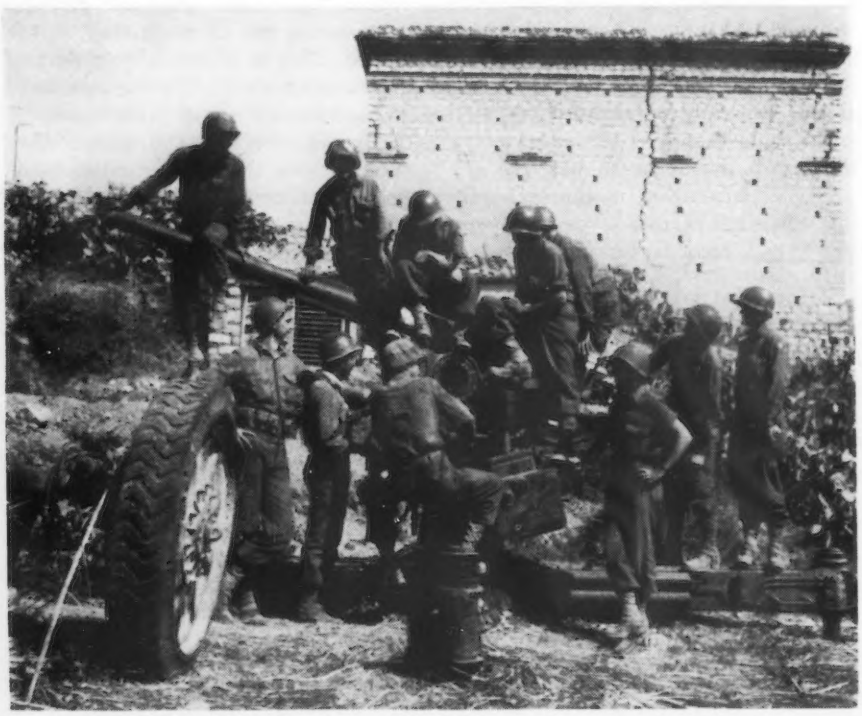
Recently this small coke plant offered time and a half to its employees, on a holiday, but at the end of the day 10 ovens out of the 23 had not been pulled. A day later the absentee rate was exceptionally high, and seven more ovens were left in, leaving only 16 pulled. On the third day, five ovens were left in with 18 pulled.

Some of the best coke pullers have long since been drafted or have gone into other war work.

Actual production is down, due to ovens being left in longer and due to unskilled pullers. In May of this year about 10,500 ovens out of 11,700 were operating in the Connellsville district. Around the first of August 10,300 out of 12,000 were operating. Since that time, a considerable number of ovens have had to cease operations because of lack of coal, and others may go out of business because of material and labor costs.

It is expected that the tight coke situation will hasten some form of transportation relief so coking coal can be brought into Western Pennsylvania from distant points. The diversion of coking coal for metallurgical purposes will also help some.

CAPTURED GUN GETS THE "ONCE-OVER": Allied troops inspect a captured German 75 mm. anti-aircraft gun near Messina, Sicily.



Merged Committees Will Unite U.S.-British Conservation

Washington

• • • **William L. Batt,** WPB vice chairman and American member of the Combined Raw Materials Board has announced the formation of a Combined Conservation Committee which will work with the Combined Production and Resources Board and the Combined Raw Materials Board. The purpose of the Combined Committee is to correlate the conservation work done in Great Britain and the United States and by the active interchange of information of conservation measures developed in the United States, Canada and the United Kingdom, to bring about maximum saving of materials in these three countries.

10,000 Machine Tools Available For Transfer to War Contractors

Washington

• • • **The Ordnance Department** of the Army now has more than 10,000 machine tools available for transfer to war contractors who need them.

The tools have been declared excess by munitions manufacturers in Ordnance Districts whose contracts have been cut-back or terminated. The fact that a tool is excess to a particular manufacturer does not mean that it is considered surplus by the War Department, a War Department spokesman pointed out.

Available tools are listed periodically by the Office of the Chief of Ordnance. The latest list, No. 2, issued on Sept. 2, covers 146 pages and has been circularized to about 1200 points where the need for tools by war industries is known. Typical recipients of the list are Ordnance District Offices, arsenals, depots and powder plants, and Navy material inspectors.

Reflecting the trend of transfers of tools as reported by Ordnance Districts is the accompanying table prepared from information furnished by the Ordnance Department Redistribution Salvage Section.

Complete information on January, February and August is not available.

The way excess tools get on Ordnance Department lists follows: (1) The manufacturer declares them to be excess to the District Ordnance Office; (2) for a period of 20 days the District Ordnance Office attempts to dispose of the tools to contractors working for the various war agencies (it is probable that more than half of all excess tools are disposed of in this way); (3) remaining excess tools are reported to the Ordnance Department in Washington, which prepares the list for circularizing.

For 90 days after the list's publication, the Ordnance Department takes the following steps to dispose of the tools: (1) Those needed in the future for strategic reasons are stored; (2) transfers are sought for remaining tools to other Ordnance establishments to replace less efficient equipment; (3) thereafter, tools are for sale to industry in general, including the original manufacturer for definite use in the production of either essential or so-called luxury items.

After the foregoing procedure, any remaining tools are either scrapped, or made available to the public for sale by the Procurement Division of the Treasury, as surplus tools.

Whenever consideration is given to the scrapping of tools, the Ordnance District Office is requested to reinspect the tools and submit recommendations of whether the tools should be repaired or scrapped. The recommendation of the machine tool panel member is given especial weight.

Ordnance does not permit the purchase of tools for speculative purposes prior to the declaration that they are surplus. Tools cannot be purchased for storage and in anticipation of an indefinite future commercial requirement without prior approval of the Redistribution and Salvage Section.

ORDNANCE DISTRICTS
Machine Tool Transfers By Lots

	Mar.	Apr.	May	June	July
Birmingham	6	51	19	25	57
Boston	51	44	17	24	34
Chicago	168	163	164	78	98
Cincinnati	36	27	35	25	27
Cleveland	62	51	36	33	36
Detroit	118	140	71	98	59
New York	24	30	24	35	36
Philadelphia	35	40	30	20	42
Pittsburgh	38	36	36	13	27
Richmond	52	49	43	66	59
St. Louis	25	22	26	21	50
San Francisco	24	4	12	8	24
Springfield	24	24	25	23	35
Arsenals	27	38	43	41	24
All others	51	76	55	109	168
	741	795	636	619	776

Members Appointed to Valve And Pipe Fittings Committee

• • • **OPA has appointed** the following 17 executives to serve on the Valve and Pipe Fittings Industry Advisory Committee:

S. L. Barber, Taylor Forge & Pipe Works, Chicago; Ernest Cochran, Chapman Valve Mfg. Co., Indian Orchard, Mass.; W. F. Crawford, Edward Valve Mfg. Co., East Chicago, Ind.; G. A. Daeuble, Jr., Henry Vogt Machine Co., Inc., Louisville, Ky.; J. P. Ferguson, Reading-Pratt & Cady Division, American Chain & Cable Co., Inc., Reading, Pa.; R. E. Fritsch, Tube-Turns, Inc., Louisville, Ky.; M. S. Plamer, Hancock Valve Division, Manning, Maxwell & Moore, Inc., Bridgeport, Conn.; O. F. Gang, Wm. Powell Co., New York; Wayne Young, Ohio Injector Co., Wadsworth, Ohio; M. L. Hough, Darling Valve Co., Williamsport, Pa.; M. E. Kennedy, Kennedy Valve Mfg. Co., Elmira, N. Y.; Bernard J. Lee, Sr., Jenkins Brothers, Bridgeport, Conn.; P. R. Mork, Crane Co., Chicago; George M. Naylor, Fairbanks Co., New York; W. O. Swaney, Kerotest Mfg. Co., Pittsburgh; W. B. Holton, Jr., Walworth Co., Inc., New York; A. G. York, Watson-Stillman Co., Roselle, N. J.

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Urges Steel Ingot and Machine Tool Stockpiling As Post-War Security Plan

Chicago

• • • **"What we need for** a worthwhile post-war America is more business in government and *less* government in business" John H. Van Deventer, president and editor of THE IRON AGE told the Chicago Industrial Advertising Association on Monday. "The only thing that can keep the wolf from our doors is for private enterprise, working on a self-liquidating, profit-making basis to underwrite adequate post-war employment," he said. Continuing, Mr. Van Deventer said, "What we do not want is that government should have the intention of increasing and not diminishing its functions as an employer.

"We cannot hope, in the steel industry as in others, to maintain the full quota of war time employment. But what we should try to do is to obtain a gradual and not a sudden transition."

A gradual slowdown of the steel

• • • An English expert has compiled a "balance sheet" of the costs and results of Allied bombing upon Germany and German-occupied Europe. The total cost to the Allies of each heavy night bomber sortie is set at 5000 manhours, while the destruction caused in Germany for the same heavy night bomber sortie is set at 20,000 manhours (8000 manhours per ton of bomb load). The gain per sortie is thus said to be 15,000 manhours, a ratio of four to one in favor of the night bomber. A 2000-ton (800 bomber) night raid is estimated as causing 16,000,000 manhours of damage and costing 4,000,000 manhours to the Allies. Day bombing destruction per sortie is set at 11,000 manhours, and the total cost per day-bomber sortie is estimated to be 4500 manhours.

industry to a more normal production basis through government stockpiling of ingots was suggested by Mr. Van Deventer who pointed out that "Steel ingots stored underground and owned by the government as insurance against future wars are not merely steel. They are man-hours of labor in mines, on railroads and ore boats, in scrap yards and in a hundred or more contributory industries. They are transportation as well as production. But most of all, they are a bulwark against aggression."

Let the government, after this war, finance the purchase of 30 or 40 million tons of this precious metal on a progressively decreasing schedule covering from two to three years and it will have insured an adequate future supply of steel and have solved the problem of reconverting the steel industry without drastic and sudden unemployment, he said.

"Then there is the machine tool industry. Its expansion has been approximately 700 per cent.

"Like steel, the machine tool industry is a basic war industry. It does you no good to have plenty of steel unless you have enough machine tools to convert it into war material. The thing to do here, as I see it, is to padlock the doors of such of these plants as cannot be turned over to private ownership; slush down the machinery with grease and regard them as national defense assets for the future."

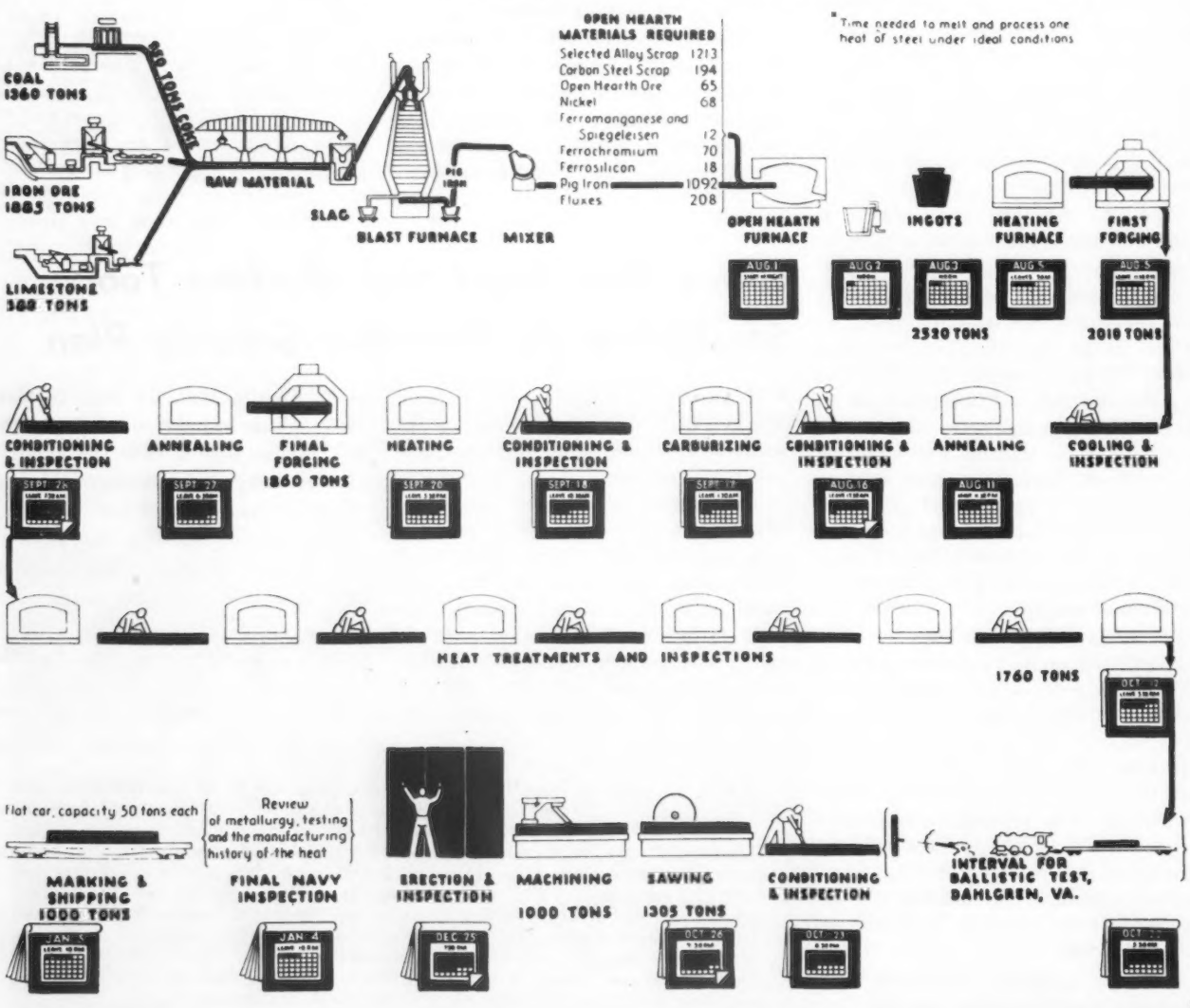
TWO CHARTS: Where the time goes when a brass mill starts working on an order is shown in the chart on the opposite page, prepared by the Non-Ferrous Sub-Unit of the Materials Distribution Branch, Dayton, Ohio. This unit is headed by Maj. M. C. Durbin, who is under Lt. Col. A. E. R. Peterka and Comdr. J. M. Weldon. Below is a time-cycle chart covering armor plate. It was developed by the American Iron and Steel Institute.

PRINCIPAL OPERATIONS IN PRODUCTION OF

1000 TONS OF CLASS "A" MAIN BELT ARMOR FOR BATTLESHIPS

APPROXIMATELY 12" THICK

TOTAL RAW MATERIALS REQUIRED - 5481 NET TONS
TOTAL FINISHED PRODUCT YIELDED - 1,000 NET TONS
ELAPSED TIME, STEEL FURNACE TO SHIPPING DEPT. - 5 MO. 6 DAYS*

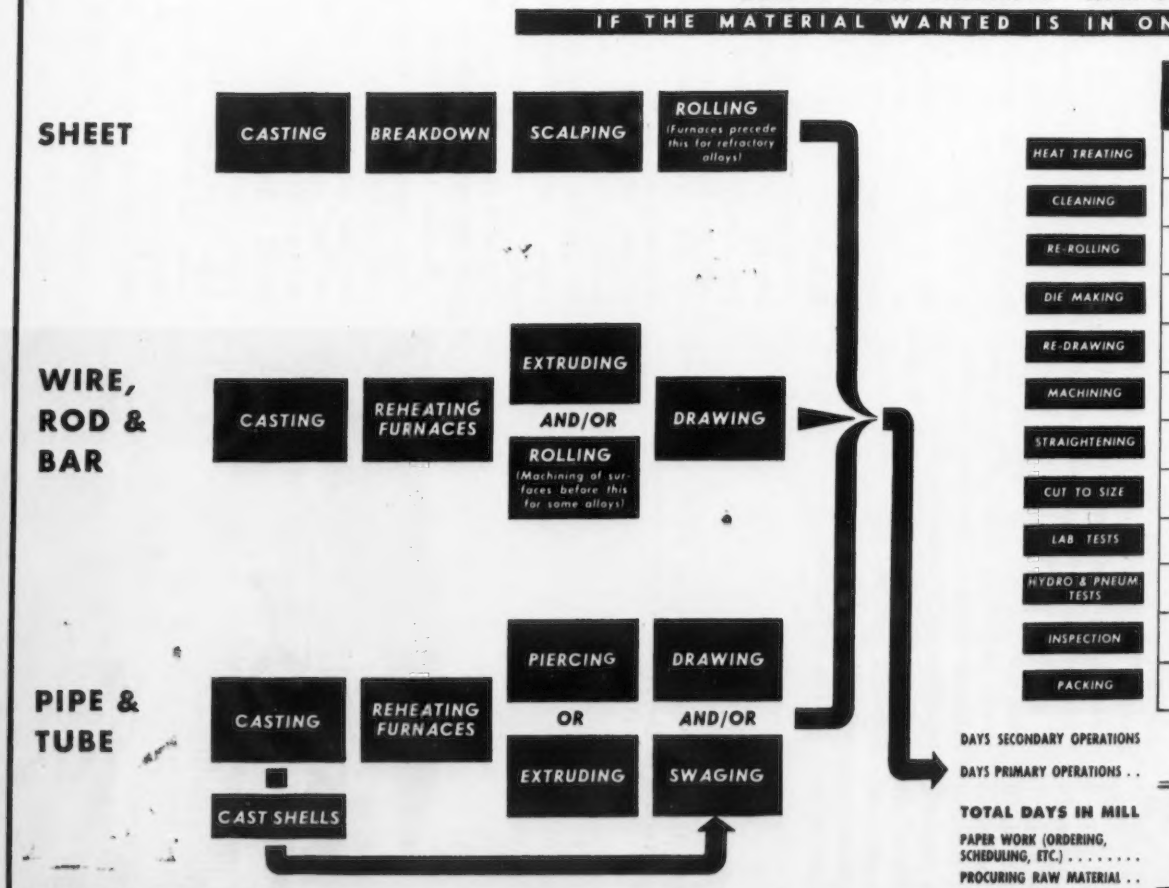


* Time needed to melt and process one heat of steel under ideal conditions

FLOW OF TYPICAL AIRCRAFT

BRASS MILL ORDERS

UNDER "FULL-CAPACITY" WAR CONDITIONS



	APPROXIMATE NUMBER OF DAYS REQUIRED FOR SECONDARY OPERATIONS														
	SHEET 20" & OVER	STRIP UNDER 20"	EXT. SHAPES	BAR	ROD 1 2" & OVER	ROD 1 2" & UNDER	SOLID WIRE AWG 526 & LARGER	WIRE 7 STRAND	WIRE 19 STRAND	TUBE 10" & OVER	TUBE 5"-10"	TUBE 1"-5"	TUBE 1 2"-1"	TUBE 3/16"-1 2"	TUBE 1/64"-3/16"
HEAT TREATING	4	5		1	1	2	1	1	1	6	4	3	4	6	8
CLEANING	1	2	1	1	1	2				3	2	2	3	4	5
RE-ROLLING	6	4													
DIE MAKING			12	5	4	4	4	4	4	9	6	8	5	2	2
RE-DRAWING				2	1	2	3	5	7	8	7	5	4	7	10
MACHINING	2		1	1			STRANDING WIRE TAKES ABOUT 3 MORE DAYS								
STRAIGHTENING	1	1	4	1	1	1				2	2	1	1	2	2
CUT TO SIZE	1	1	1	1	1	1	Insulation of wire is done in WIRE & CABLE mills and may take up to 35 more days			2	1	1	1	1	2
LAB TESTS	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
HYDRO & PNEUM TESTS										1	1	1	1	2	3
INSPECTION	1	1	2	1	1	2	1	1	1	2	2	2	2	2	3
PACKING	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DAYS SECONDARY OPERATIONS	19	17	24	16	13	17	12	14	16	36	28	26	24	29	38
DAYS PRIMARY OPERATIONS . .	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
TOTAL DAYS IN MILL	**33**	**31**	**38**	**30**	**27**	**31**	**26**	**28**	**30**	**50**	**42**	**40**	**38**	**43**	**52**
PAPER WORK (ORDERING, SCHEDULING, ETC.)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
PROCURING RAW MATERIAL . .	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
AFTER ORDER (WITH CMP ALLOTMENT NUMBER) IS ACCEPTED, SHIPMENT (BARRING DELAYS*) CAN BE EXPECTED IN ABOUT THIS MANY DAYS	**50**	**48**	**55**	**47**	**44**	**48**	**43**	**45**	**47**	**67**	**59**	**57**	**55**	**60**	**69**

***DELAY FACTORS**

1. Waiting for carload lots before shipping from mills.
2. Government inspection time.
3. Specifying exceptionally close tolerances.
4. Refractory alloys — silicon, aluminum, beryllium, phosphor bronzes, etc. — take more time to produce than the ordinary alloys.
5. Machine breakdown delays. (Under CMP, mills are allowed to ship in month after promised delivery month if breakdowns occur.)

NOTES:

Pure copper products in forms and sizes shown take about the same time as alloys.
Forgings need extra operations, adding about two weeks to rod and bar schedules shown.
Castings depend on finish required.
Under CMP, mills can reject refractory alloy orders placed less than 60 days prior to specified month of delivery, and other metal orders under 45 days.
Under CMP, mills can not ship earlier than 15 days prior to month of specified delivery, and may ship in following month if necessary because of breakdown delays.

OPEN MILL CAPACITY — IN THE SIZE AS WELL AS THE ALLOY AND SHAPE — MUST BE AVAILABLE, OR ELSE THE ORDER MUST BE REJECTED

THE ANSWER? - - - - *ORDER EARLY!*

Produced by
Non-Ferrous Metals Sub-unit
Material Distribution Branch, R.C.S.
Wright Field, Dayton, O.
Aug. 1, 1943

NEWS OF INDUSTRY

"Drowsing Giant" of South Now Undergoing Notable Expansion, Paced by Steel, Aluminum Projects.

o o o

• • • **A new outlook** on industrial relations and new techniques of industrial economy form a firm foundation for developing Brazil's vast natural resources, latent during the nation's long period of colonial economy.

In 1889 there were in all Brazil only 903 industrial establishments. In 1935 there were 60 times that number and today Brazil has more than 60,000 industrial plants. Yet an enormous field for industrial expansion remains in this nation of 41,565,083 persons. Against the 880 lb. United States per capita consumption of steel and iron products, Brazil's per capita consumption is estimated by the Co-ordinator of Inter-American Affairs at only 22 lb.

Striving now for balanced economic progress, Brazil is expected to emerge from the war period somewhat less dependent upon foreign nations. This does not necessarily means that the total of Brazil's external trade will decrease, but the composition of the trade probably will change so that a greater volume of intra-South American trade will develop with Brazil exporting more of its manufactured goods to the other American republics while importing from those nations raw materials which Brazil formerly obtained from more distant sources.

Wide utilization of hydro-electric power from Brazil's rivers; expanding use of the airplane; the extension of communications and transportation, and the development of steel and aluminum—these are among the current trends in the industrial stimulus, which stems from the large Atlantic coastal cities and is penetrating to the hinterland regions.

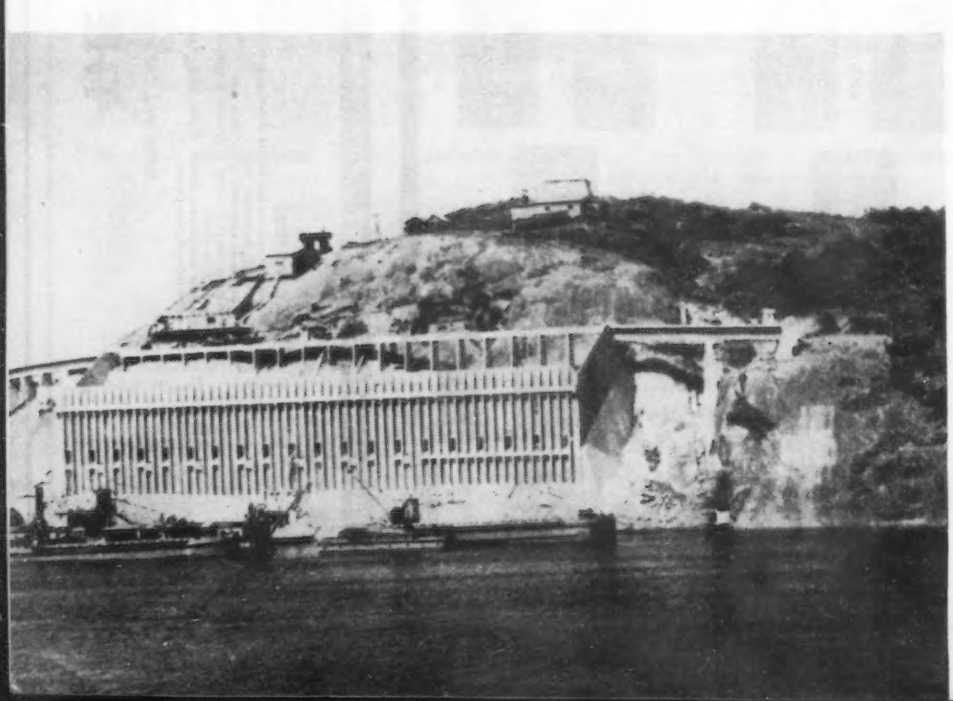
Brazil also has a small machine tool industry which has made important strides during the current war.

Brazil manufactures paper, cigarettes, fabricated metal goods, drugs and chemicals, ceramics and glass, matches, and a variety of other consumer items for domestic consumption. Its construction boom currently is of large proportions. The $75,000,000 steel mill at Volta Redonda is expected to be completed some time in 1944. The United States and Brazil jointly financed this project. The Export-Import Bank of Washington has agreed to lend Brazil up to $45,000,000 for this project, and Brazil has contributed about $30,000,000, making a total of approximately $75,000,000. The Export-Import Bank originally authorized a credit of $20,000,000 which has been increased twice—once for $5,000,000 and again for $20,000,000. The agreement provides that credit funds be utilized solely for the purchase from the United States of all equipment to be installed in the steel plant.

Besides the $45,000,000 authorized credits extended for Brazil's new steel mill the Export-Import Bank has authorized additional credits of $131,000,000, making a grand total of $176,000,000 in credits extended to Brazil. As was the case with the United States in the expansionist era, Brazil's program of industrialization needs more foreign capital for full development, as well as the country's own trained industrial technicians.

(CONTINUED ON PAGE 108)

LOADING OF ORE: Here is a 47,000-ton storage dock at the Port of Vitoria, State of Espirito Santa, terminus of the Minas-Vitoria Railroad.



August Ingot Output Up 200,000 Tons

YEAR 1943

Production of Open Hearth, Bessemer and Electric Steel Ingots, and Steel for Castings. Source: American Iron & Steel Institute

Based on Reports by Companies which in 1942 made 98.3% of the Open Hearth, 100% of the Bessemer and 87.6% of the Electric Ingot and Steel for Castings Production

Period	Estimated production—all companies: Open Hearth Net tons*	Open Hearth Percent of capacity	Bessemer Net tons*	Bessemer Percent of capacity	Electric Net tons*	Electric Percent of capacity	Total Net tons*	Total Percent of capacity	Calculated* weekly production all companies (Net tons)	Number of weeks in month
January	6,576,589	97.8	478,058	85.9	369,395	95.4	7,424,042	96.8	1,675,856	4.43
February	6,033,674	99.3	447,843	89.1	344,532	98.6	6,826,049	98.5	1,706,512	4.00
March	6,785,295	100.9	503,673	90.5	381,219	98.5	7,670,187	100.0	1,731,419	4.43
1st Quarter	19,395,558	99.3	1,429,574	88.4	1,095,146	97.5	21,920,278	98.4	1,704,532	12.86
April	6,509,812	99.9	481,810	89.4	382,532	102.1	7,374,154	99.3	1,718,917	4.29
May	6,664,298	99.1	483,024	86.8	398,057	102.9	7,545,379	98.4	1,703,246	4.43
June	6,188,857	95.0	453,599	84.1	384,645	102.6	7,027,101	94.6	1,638,019	4.29
2nd Quarter	19,362,967	98.0	1,418,433	86.7	1,165,234	102.5	21,946,634	97.4	1,686,905	13.01
1st 6 months	38,758,525	98.7	2,848,007	87.6	2,260,380	100.0	43,866,912	97.9	1,695,667	25.87
July	6,516,387	*96.2	466,288	*90.6	393,342	*94.0	7,376,017	*95.7	1,668,782	4.42
August	6,669,944	98.3	484,957	94.0	407,224	97.1	7,562,125	97.9	1,707,026	4.43

Note—The percentages of capacity operated are calculated on weekly capacities of 1,518,621 net tons open hearth, 125,681 net tons Bessemer and 87,360 net tons electric ingots and steel for castings, total 1,731,662 net tons; based on annual capacities as of January 1, 1943 as follows: Open hearth 79,180,880 net tons, Bessemer 6,553,000 net tons, electric 4,554,980 net tons. Beginning July 1, 1943, the percentages of capacity operated are calculated on weekly capacities of 1,531,789 net tons open hearth, 116, 494 net tons Bessemer and 94,667 net tons electric ingots and steel for castings, total 1,742,950 net tons: based on annual capacities as follows: Open hearth 79,867,450 net tons, Bessemer 6,074,000 net tons, Electric 4,935,960 net tons. * Revised.

YEAR 1942

Period	Estimated production—all companies: Open Hearth Net tons*	Open Hearth Percent of capacity	Bessemer Net tons*	Bessemer Percent of capacity	Electric Net tons*	Electric Percent of capacity	Total Net tons*	Total Percent of capacity	Calculated* weekly production all companies (Net tons)	Number of weeks in month
January	6,322,215	95.3	490,874	86.0	299,017	94.2	7,112,106	94.5	1,605,442	4.43
February	5,785,918	96.6	453,549	88.0	273,068	95.2	6,512,535	95.9	1,628,134	4.00
March	6,572,930	99.0	493,191	86.4	325,990	102.7	7,392,111	98.2	1,668,648	4.43
1st Quarter	18,681,063	97.0	1,437,614	86.7	898,075	97.4	21,016,752	96.2	1,634,273	12.86
April	6,345,133	98.7	454,834	82.2	321,324	104.5	7,121,291	97.7	1,659,975	4.29
May	6,595,440	99.4	453,938	79.5	333,200	104.9	7,382,578	98.1	1,666,496	4.43
June	6,239,674	97.1	452,528	81.8	323,100	105.1	7,015,302	96.3	1,635,269	4.29
2nd Quarter	19,180,247	98.4	1,361,300	81.2	977,624	104.8	21,519,171	97.4	1,654,049	13.01
1st 6 months	37,861,310	97.7	2,798,914	83.9	1,875,699	101.1	42,535,923	96.8	1,644,218	25.87
July	6,345,315	95.7	453,686	79.6	345,957	96.6	7,144,958	94.5	1,616,506	4.42
August	6,414,637	96.5	467,293	81.8	345,725	96.3	7,227,655	95.4	1,631,525	4.43
September	6,286,855	97.9	437,961	79.4	332,703	95.9	7,057,519	96.4	1,648,953	4.28
3rd Quarter	19,046,807	96.7	1,358,940	80.3	1,024,385	96.3	21,430,132	95.4	1,632,150	13.13
9 months	56,908,117	97.3	4,157,854	82.7	2,900,084	99.4	63,966,055	96.3	1,640,155	39.00
October	6,750,829	101.5	461,897	80.9	366,788	102.2	7,579,514	100.0	1,710,951	4.43
November	6,371,750	99.0	458,469	82.9	349,593	100.5	7,179,812	97.8	1,673,616	4.29
December	6,471,261	97.6	475,204	83.4	358,075	100.0	7,304,540	96.6	1,652,611	4.42
4th Quarter	19,593,840	99.4	1,395,570	82.4	1,074,456	100.9	22,063,866	98.2	1,679,137	13.14
2nd 6 months	38,640,647	98.0	2,754,510	81.3	2,098,841	98.6	43,493,998	96.8	1,655,653	26.27
Total	76,501,957	97.9	5,553,424	82.6	3,974,540	99.8	86,029,921	96.8	1,649,979	52.14

Note—The percentages of capacity operated in the first 6 months are calculated on weekly capacities of 1,498,022 net tons open hearth, 128,911 net tons Bessemer and 71,682 net tons electric ingots and steel for castings, total 1,698,622 net tons; based on annual capacities as of Jan. 1, 1942, as follows: Open hearth 78,107,260 net tons, Bessemer 6,721,400 net tons, electric 3,737,510 net tons. Beginning July 1, 1942, the percentages of capacity operated are calculated on weekly capacities of 1,500,714 net tons open hearth, 128,911 net tons Bessemer and 81,049 net tons electric ingots and steel for castings, total 1,710,674 net tons; based on annual capacities as follows: Open hearth 78,247,230 net tons, Bessemer 6,721,400 net tons, Electric 4,225,890 net tons.

48-Hr. Week Causes Granite City Strike

St. Louis

• • • **A nine-day strike** of 300 employees in the openhearth department of the Granite City Steel Co. has ended. Three of the company's furnaces were down for seven days, and the other five were out for the last four days. The strike which threatened to halt production of armor plate for the Navy, was a protest against reduction of overtime pay and changes in days off resulting from the 48-hour week schedule which the WMC had applied to all steel companies.

The strike was unauthorized. Neither the company nor the CIO United Steel Workers of America would announce the terms of the settlement other than to say that a satisfactory work schedule had been devised. It is understood that the management and the union had been instructed by the WLB to withhold terms of the settlement.

Production, Shipments, Payrolls Gain in Steel; Strike Causes Loss

• • • **Production** of steel ingots and castings in August (detailed in the accompanying table) rose nearly 200,000 tons above the July total and came close to the all-time high mark set last March when 7,670,187 tons were turned out, according to the American Iron and Steel Institute. Last week's ingot production set an all-time record for tonnage, when mills operated at 100.3 per cent, thereby turning out 1,748,200 tons.

U. S. Steel Shipments — August shipments of the Corporation were 1,704,289 net tons, a jump of 43,527 tons from July but below the 1,788,650 tons in August, 1942. For the year to date shipments were 13,405,067 tons, against 14,057,906 tons in the comparable part of 1942.

Steel Payrolls—The July total of $142,769,000 set a new peak, according to the Institute. Employment continued to decline, the total number being 627,000 against 631,000 in June and 655,000 in July, 1942. Average earnings were 115.5c. per hour in July, highest on record. Wage earners worked an average of 43.5 hr. per week in July.

Steel Earnings—In the first half of 1943, earnings dropped 8 per cent below the same part of 1942, according to the Institute. In the six months ending June 30, net income of 90 per cent of the industry's capacity were $94,522,000 after all charges and before dividends. Increased payrolls were assigned as the cause of the decline.

Record by C-I—Steelmakers of Carnegie-Illinois shattered all past records for production in August, producing 1,962,631 tons of ingots. That's 19,000 tons better than the best previous record set in March.

Praise From Nelson—Donald M. Nelson, chairman of WPB, congratulated Eugene G. Grace, president of Bethlehem Steel Co., and Philip Murray, president of the United Steelworkers of America, for the August steel production record by Bethlehem (THE IRON AGE, Sept. 9, p. 138).

Steel Strikes—Scarfers at the Irvin Works of C-I caused a loss of 8500 tons of plates last week during a two-day dispute.

PRIORITIES FOR LABOR

Unions Bitter over Buffalo Plan; Light Industries Also Have Objections

Buffalo

• • • **The Buffalo-Niagara Controlled** Referral Hiring Plan will not be the model for a national service act in its present form so long as labor and industry both continue to find it at fault, if opinion here is a criterion. With the forces of labor and industry fighting different aspects of the plan and with the government keeping a wary eye on both the production level of the nation and its votes, WMC's pressure to extend the plan may be eased. Numerous modifications are a certainty.

The attitude of labor on the subject, as expressed by one of Buffalo's leading union executives and a member of the area war manpower committee, is that as now exercised, the referral plan operates entirely against the working man. The only plants on the priority list, which in theory at least must be given first call on applicants for jobs, are, he says, "dirty, low paying plants."

While labor men acknowledge that some plan must be provided they object to the provisions which send some workers to jobs paying less than the jobs they previously held.

Another objectionable feature, the unionist contends, is the 30-day layoff period enforced on a worker before he can "hop" to another job. (The idle period is scheduled to be extended to two months after Oct. 1 unless the worker has compelling personal reasons for changing jobs.)

Labor, too, claims the referral plan in its present form leaves the discharged worker at the mercy of the United States Employment Service. The worker goes where he is referred or he doesn't go anywhere. He retains the right to refuse as many jobs as he chooses, which doesn't help him or production.

The heavy industries have high regard for the Buffalo referral plan and spokesmen assert they have gained labor through its operation whereas before it went into effect they continually lost help.

The light industries—and this includes airplane factories, which number their employees in the tens of thousands—are against the plan to the extent they are not on the priority list, have been told to hire women, and are not getting the number of male workers through referral they feel they should get.

An objection both on the part of labor and industry is that under the referral plan the majority of small businessmen "haven't a chance."

Labor also wants the USES to recognize fully "legitimate" doctor's certificates when presented by applicants for jobs.

The recent Byrnes directive putting the Buffalo plan into effect on the West Coast is regarded by Hugh Thompson, regional director of the CIO in Buffalo, as a move "to tear down established wage structures."

"The referral plan's only purpose so far," said Thompson, "has been to supply workers to firms paying low wages—firms which are having difficulty completing war contracts because they have been unable to hire workers.

"Through the vicious labor priorities system established under this plan, workers are routed to these poor paying companies. . . . Many heavy industries are paying wages below what might be called a suitable going wage rate, simply because the WLB either is slow in acting or refuses to authorize wage increases."

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Priority Plan Rates Industries in Four Groups

• • • **The** Buffalo plan is a labor priority and controlled referral program in operation in the Buffalo-Niagara area since late June. It has been extended to West Coast cities. The plan, which is the most drastic that can be undertaken under present WMC authority, is meeting with considerable opposition from labor and from some portions of management, but there is general agreement that it has alleviated the Buffalo situation.

The program, known as CRP (Controlled Referral Plan) makes absolutely mandatory the hiring of all male labor through the United States Employment Service, which is guided by a labor priorities list, drawn up by a local priority committee. Non-priority companies must draw most of their labor supply from the womanpower pool, which is not covered by controlled referral. Whether or not a non-priority company gets any male labor depends on the tightness of supply. Non-priority companies in the Buffalo area are now getting nearly 25 per cent of the male labor.

The machinery of the plan in Buffalo has worked like this. The local priority committee referred to the Washington WPB the names of about 700 local war plants. These were rated in Washington in four groups—bottleneck plants, plants in which production must be kept up, plants which in the national picture are vitally necessary but where production can be eased in the Buffalo area, and plants whose production can be dropped entirely in the Buffalo area.

The Washington ratings are taken as a guide by the local priority committee. Translating the Washington guide of how the plant's production fits into the whole pattern of war output, together with its own investigations, into manpower needs, the local committee then puts the company on an "A" list, a "B" list (for temporary or emergency needs) or gives it no priority listing at all. Listed companies are assigned a specified number of new employees.

At present about 100 Buffalo plants have priority listings, with steel, chemical, castings and brass mill producers most favored. Of the three aircraft builders in the area, two have yet to be placed on the preferred register. One, with a steep climb in schedule, was given a 1000-worker priority, on condition it hire also 1000 women.

The omission of women workers from CRP is intended to ease the lot of non-priority companies, and also to encourage the hiring of women. It is not mandatory for a worker to accept a job at the plant to which he is first referred, nor is it mandatory for the company to take him. Eventually, however, a worker must take some sort of USES referred job. At present, about 25 per cent of the men referred to jobs do not turn up. Of the remaining 75 per cent, two out of three take jobs.

Greatest single failure of the plan, seemingly attributable to its management, traces to perhaps devious methods and extreme secrecy shrouding the establishment of priority ratings for companies. No company is permitted to know either its own or another company's referral priority. Hence, a general distrust, which has flared into a public brawl on at least one occasion, and a perfect opportunity for bribery and graft if governing powers can be reached.

CSP and M-293 to Merge; Plan Component Production Despite Ratings

Washington

• • • **WPB will soon issue** an order incorporating the component scheduling plan in the overall component scheduling order, M-293. Opponents of CSP say that the incorporation will result in confusion to component manufacturers and an increased amount of paper work.

The new order would establish a new class "Z" in addition to classes "X" and "Y" already scheduled under M-293. The components included in Class "Z," it is contended, would cut entirely across the field of A and B products so far as applications for material are concerned. A new form designated as WPB 3400 has been devised. On this form the component manufacturers would advise WPB of their shop capacity and the materials needed to make the Class "Z" components.

To illustrate how confused the new order may be the following is an example of what a manufacturer may encounter: In the case of a class "Z" product which is also a class "X" or "Y" product a purchase order covered by form WPB 3400 becomes a part of a frozen schedule. If the class "Z" product is not also an "X" or a "Y," then even though the purchase order is covered by WPB 3400 it does not become part of a frozen schedule unless the person who places the order elects to comply with the following additional conditions: (a) Before sending the form to his supplier he gets it certified as to accuracy by the appropriate claimant agency; (b) he obtains approval of WPB to the freezing of his supplier's schedule.

"This certification and approval are obtained and the manufacturer with whom the order is placed accepts the same and agrees to ship on the date specified in the form, then the order automatically becomes part of a frozen schedule, and the manufacturer must schedule his production and make his shipments so as to fill the schedule without regard to preference ratings or directions from any governmental agency except as amended by WPB," the order says. "A manufacturer must not accept an order which interferes with a previously frozen schedule."

The foregoing applies only according to the new order to programs as follows: ships as programmed by the Navy Department, the Maritime Commission, and the War Department; advance and overseas bases as programmed by the Navy Department; tanks, combat vehicles and motor transport vehicles as programmed by the War Department; power generating plants as programmed by the Office of War Utilities; plants designed for the production of rubber as programmed by the Office of the Rubber Director; plants designed for the production of high-octane gasoline as programmed by the PAW.

With minor modifications class "Z" products will include those components listed by the original CSP plan as control and sub-control components they were:

Turbines and turbo-generators, motor generator sets, internal combustion engines, boilers, compressors and dry-vacuum pumps, turbo-blowers and exhaustors, steam condensers, heat exchangers, pressure vessels, fans and blowers, switch gear, pumps, stokers, pulverizers, transformers (when purchased directly from the manufacturer by the prime contractor or claimant agency building the project or manufacturing the product into which the component will go).

Sub-components: fuel injectors, carburetors, magnetos, reduction gears, electric motors, electric motor controls and generators or any of the control components listed when purchased by a person other than a prime contractor or a claimant agency.

The whole idea of the revised scheduling order is to green-light component production without any regard for allotment numbers or preference ratings.

WPB officials who do not like the plan say that indiscriminate production of components may break bottlenecks but may at the same time cause material pinches on other products.

The new order would relieve all persons from complying with the following provisions of WPB orders for components which come under order M-293: M-50, provisions of paragraphs (B) (2), (F) (1), and (F) (2); M-76, provisions of paragraphs (C) (D) (E) and (F); L-100, all provisions except that the order remains effective as to second-hand or reconditioned equipment; L-117; provisions of paragraphs (B) (C) and (D); L-163 all provisions; L-172, all provisions except (D) (2) and (D) (3); L-193, provisions of paragraph (B) (1), the first sentence only of paragraph (C) (1) and paragraph (D) and (F); L-203, provisions of paragraphs (B) (1) and (B) (2); L-234, all provisions; E-6, provisions of paragraph (D) (2); E-10, provisions of paragraphs (C) and (D).

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Farm Machinery Exporting Explained

Washington

• • • **Manufacturers of farm machinery** and equipment shall submit license applications or release certificate applications (under a program license) in accordance with the following procedure for proposed exportations of farm machinery, equipment, and repair parts built under Order L-257A. The procedure covers all farm equipment listed in Schedule A of Order L-257 (except horseshoes and horseshoe nails) regardless of Department of Commerce Schedule B numbers.

Applications for such licenses or release certificates submitted by a manufacturer must be accompanied by a signed statement in duplicate as follows, giving the information requested:

(1) Net shipping weight of export quota assigned to applicant for country of destination.

(2) Total net shipping weight of all charges against applicant's quota for country of destination since July 1, 1943, exclusive of pending applications for licenses or release certificates.

(3) Net shipping weight of applications by applicant pending action to country of destination, including this application.

(4) Net shipping weight of this application.

The statements made above are to be considered a part of our attached export license or release certificate application covering equipment, the production of which is authorized by Limitation Order L-257A.

An exporter who is not a manufacturer of farm machinery and equipment may submit an application for a license or a release certificate to export such farm machinery built under Order L-257A but must accompany every such application with a letter from a manufacturer authorizing the applicant to charge the material against his (the manufacturer's) quota for export to the country of destination. The manufacturer must also state that the quantity of material covered by the order is within his quota for export to the country of destination and he must agree to include the order as a charge against such quota when submitting any subsequent applications.

It should be noted that in contrast

with the procedure under Order L-170, the accounting under Order L-257A will be kept in tonnage rather than dollars and will include all items manufactured under the limitation order (except horseshoes and horseshoe nails) instead of only a part of such items.

Inasmuch as Orders L-170 and L-257A will be in effect concurrently between July 1, 1943, and Sept. 30, 1943, applicants for export licenses or release certificates should exert extreme care in segregating applications under each of these orders so that no confusion will result. Applications to export farm equipment built under Order L-170 are still to be submitted in the manner outlined on page 95 of the Comprehensive Export Schedule No. 11. After Sept. 30, 1943, applications will be accepted for shipments under L-257A quotas only. The reporting requirements set forth in this bulletin have been approved by the Bureau of the Budget.

Parts Export

Effective immediately, manufacturers of farm machinery, tracklaying tractors, or allied equipment, who wish to export replacement parts for products of their own manufacture to any one consignee may file a single license application to include any number of such related parts.

Although these related parts may be classified under different Department of Commerce Schedule B numbers, it will be permissible to include them under the appropriate Schedule B number for parts with respect to certain classes of equipment.

As an example, a single application may be filed covering tracklaying tractor equipment parts which shall be identified by Schedule B No. 7889.01, and which may include such related commodities as rubber fan belts, cork, gaskets, or other commodities when they are to be shipped by the tractor manufacturer as tractor equipment replacement parts. Similarly, single applications may be filed to cover related harvesting and cultivating equipment replacement parts under No. 7899.05, and road equipment replacement parts under No. 7228.00.

When such replacement parts for the manufacturer's product are included in a single application, the total quantity of parts to be shipped and their net weight and the total value of the parts must be shown, as well as a statement that the parts are for use only as replacements in equipment manufactured by the applicant.

This change in procedure makes it unnecessary for the manufacturer to list in detail different items of such replacement parts.

If the parts for which an application is to be filed under this procedure are included on more than one import recommendation, the applicant should attach all the No. 4 copies of the import recommendations to his license application. He should make certain that the parts listed on the license application coincide with those listed on the import recommendations.

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WPB Moves to Protect Civilian Production; Issues Quota Directive

Washington

• • • **Because WPB suspects** that the Army and Navy received most of the steel previously allocated for civilian use, the 225,000 tons (see THE IRON AGE of Aug. 5) allotted for the production of consumer goods in the fourth quarter will be protected by a special directive to manufacturers.

The directive, which was made public by WPB last Friday, requires manufacturers of consumer goods to set aside a percentage of their production for distribution through normal retail outlets.

If WPB regulations, or preference ratings, threaten to prevent the manufacturer from complying with the directive, he is to notify WPB of the circumstances. Thereafter, WPB may inform the manufacturer to disregard the regulations or preference ratings, or to make any adjustments it considers appropriate.

On Aug. 18, WPB issued a similar directive which commanded manufacturers to disregard all preference ratings except AAA-1. This directive was considered by the Army as a pistol pointed directly at it. The directive would have prevented the armed services from purchasing the goods after manufacture, except upon issuance of the highest emergency rating.

Finally, military representatives became so provoked by stories appearing in the daily press about the directive and to the effect that the Office of Civilian Requirements would soon make available to consumers washing machines and electric irons, that they pressured WPB into revoking this order. Later WPB issued a statement saying that washing machines would not be made until some time in 1944.

A compromise resulted in the issuance of the present directive which has already been sent to some manufacturers. Army representatives thought the original directive and the proposed manufacture of washing machines and electric irons a premature boom for civilian goods manufacture considering the present stage of the war.

The new ruling, in the form of a letter to manufacturers of B products, reads in part as follows:

The Office of Civilian Requirements, of the WPB, has determined the amount of these products which should be distributed to civilian consumers. To give effect to this determination, it appears, on the basis of available information, that —% by ——— of your production of these products during the fourth quarter of 1943 should be distributed through customary distribution channels to civilian consumers in the United States.

This letter does not authorize you to disregard preference ratings of War Production Board regulations or orders but if they prevent you from shipping the specified percentage you are instructed to notify the War Production Board, Washington, immediately.

Price Briefs

• Amend. 1 to MPR 453 grants manufacturers of automotive parts additional time—until Oct. 1—in which to furnish their customers with required price lists, catalogs and notices of resale maximum prices. (Release No. OPA-T-1181)

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• Amend. 3 to RPS 15 clarifies provisions governing drawbacks on imports of copper to encourage purchase abroad for shipment into the United States. (Release No. OPA-3047)

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• Amend. 5 to RPS 69 clarifies provisions governing drawbacks on imports of lead to encourage purchase abroad for shipment into the United States. (Release No. OPA-3047)

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• Amend. 3 to RPS 81 clarifies provisions governing drawbacks on imports of zinc to encourage purchase abroad for shipment into the United States. (Release No. OPA-3047)

•

• Amend. 3 to MPR 248 authorizes sellers of manganese ores to use Atlantic basing points in sales calling for delivery in the area east of the Mississippi River and north of the Ohio River. (Release No. OPA-T-1173)

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• Amend. 2 to MPR 147 authorizes an alternate pricing method manufacturers may use on bolts, nuts, screws and rivets. (Release No. OPA-T-1177)

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• RMPR 213 sets ceiling prices on metal frame bedsprings. (Release No. OPA-3062)

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• Amend. 1 to MPR 408 provides for some exceptions to the catalog prices on sales of brass mill products.

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• Amendment 1 to MPR 406 excludes therefrom plastic pipe and plastic tubing manufactured from Saran B-11. (Release No. TCS-747)

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• Amendment 2 to MPR 2 gives sellers of aluminum scrap under contracts entered into before June 23 of this year an additional 30 days in which to deliver material under the contracts at the old higher maximum prices in effect before that date. On June 23 maximum prices for aluminum scrap and secondary aluminum ingot were reduced approximately one cent a lb. (Release No. TCS-743)

Industry "Well Paid" Says Jones At Contract Renegotiation Hearing

• • • **Industry has been** "pretty well paid," Jesse H. Jones, Secretary of Commerce and head of four government agencies having powers of renegotiation, said in defense of contract renegotiation before the Ways and Means Committee investigation taking place last week in Washington.

All testimony so far has been by government agents. Maurice Karker, retiring chairman of the War Department's price adjustment board, said that even though the act might be "dangerous" and "un-American," it was necessary.

Most manufacturers, allegedly are fearful of testifying against the act in this investigation because "retaliation" might be resorted to on contracts that they now hold or may be awarded them. Frank Carlson (R., Kansas) produced a letter from a constituent upholding this allegation.

Those who favor revisions of the act would like to see all contracts under $500,000 excluded from renegotiation, a suggestion approved thus far by the War Department, and a relaxation which would permit the building up of post-war reconversion funds by industry. One of the biggest points of argument has been whether profits should be figured before or after taxes.

On post-war reserves Mr. Karker said, "Provisions have already been made through tax legislation. Adequate profits are allowed to provide for post-war uncertainties." Presumably he spoke of the 1942 Revenue Act which permits the crediting of 10 per cent of excess profits taxes for post-war funds.

The matter of determining renegotiable profits before or after taxes brought the complaint that it takes a year to determine taxes and that this waiting period would take too long in view of the fact that excessive profits could be existing during the whole period.

Maury Paul, general counsel for the Treasury, told the committee that corporate profits for 1941-'42-'43 would amount to 11½-billions after payments of taxes and dividends and represented an ample reserve. However, no estimate of what part of this reserve had been returned to capital investment was possible, thus making the figure of little value even as testimony.

Jesse Jones also objected to any hint of revising the renegotiation act except that he thought renegotiation powers for his four government corporations should be broadened.

Kenneth R. Rockey, chairman of the Navy's price adjustment board, suggested that it be made mandatory that all contractors having government business file cost and price data.

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J. F. Lincoln Testifies

• • • **Appearing before the** House Committee on Ways and Means on Tuesday, President J. F. Lincoln of the Lincoln Electric Co., Cleveland, urged of the renegotiation law, contending that any reason for it has long since disappeared. He charged that five people on the Price Readjustment Board have the power through this law to destroy any industry in the United States and have already laid the groundwork for such destruction in many cases. Mr. Lincoln declared that such powers have never before been given to any group of men in the history of the United States.

After asserting that there is no recourse in the decision of the board, Mr. Lincoln said that as law is administered, efficiency is penalized, and inefficiency is rewarded. He challenged claims of Renegotiation Boards that they have saved $4,000,000.

"This is a gross deception because all but $400,000,000 has already been captured by the present tax law," Mr. Lincoln told the committee. "Even if the amount claimed by the boards had been recovered it has been lost many times over by the inefficiency forced on industry by renegotiation."

Priority Changes

L-38—Int. 2 permits the delivery of a slightly different size or priced model when necessary where substitution of an industrial or commercial refrigerator is required because of the ban on the use of freon refrigerant. (9-9-43)

•

L-83—Amendment 1 removes provisions governing food processing machinery, printing and publishing machinery, and woodworking, sawmill and logging machinery, and places them under different limitation orders. (9-6-43)

•

L-216—Sched. II as amended further defines the sizes of wrenches that may be produced. (9-3-43)

•

L-216—Sched. III designates the sizes of pliers and nippers that may be produced. (9-3-43)

•

L-216—Sched. VI reduces to approximately 40 the types and sizes of vises which may be manufactured. (9-7-43)

•

L-292—Amended order permits dairy machinery and equipment to be manufactured in a greater number of sizes than heretofore. (9-6-43)

•

L-318—Order restricts the use of certain critical materials in the manufacture of spot welding electrodes and establishes simplification and standardization practices. Effective Oct. 7. (9-7-43)

•

M-17—Amended order incorporates into the original order the new numbers of the forms to be used in reporting and making allocations of pig iron. (9-9-43)

•

M-65-a—Amended order imposes further limitations on the military exemption of cadmium to those uses required by prime contracts. (9-8-43)

•

M-78—Amended order removes from prohibited List A the use of mercury for various items and places them on List B with the allowable use restricted to certain percentages of the base period totals. (9-9-43)

Warehouses Not Aided By Copper Wire Release

• • • **Copper warehouses will** not share in the benefits of newly issued CMP Regulation No. 9 which has released small amounts of copper wire for general retail sale through hardwares, department stores, repair and radio shops.

Limitations of quantities within a $100 value or if requirements are greater than that, within one-eighth of the 1941 total, per quarter are intended to meet only emergency needs. Sale to persons who can obtain under allotment or under the terms of Reg. 5 is prohibited by the order.

•

Bolt and Nut Makers Given Price Method Option

Washington

• • • **Companies who make bolts,** nuts, screws and rivets were given an option by OPA to use MPR No. 136 in pricing special bolts, nuts, screws and rivets produced complete, or in their first operation, on hand or automatic screw machines. This permission does not result in any change in the price level.

These products are covered by MPR No. 147 but some producers have asked OPA for permission to use the provisions of MPR No. 136 under which they price their other screw machine products.

Authorization to use the machinery regulation instead of the bolt and nut regulation is contained in Amendment No. 2 to MPR No. 147, and becomes effective Sept. 14.

"Jalopy" Order M-311 Reviewed

Washington

• • • **"Jalopy" dealers** will soon know whether Order M-311 governing the breaking up of old autos is to be relaxed. Dealer complaints that the order imposes too great a burden of red tape is compelling WPB reconsideration and the possibility of amendment.

The order's revision was recommended at a meeting of WPB regional salvage managers on Sept. 9 and 10. The meeting was called by former Salvage Division Director Paul C. Cabot to consider problems connected with WPB's second "all-out" scrap drive.

Herbert M. Faust, new Salvage Division Director (whose appointment was announced in the Sept. 9 issue, page 146), attended the meeting. Mr. Faust formally takes over his duties on Sept. 15.

At the two-day meeting, it developed that compliance with Order M-311 by "junkies" slows down deliveries of scrap to the mills. The order requires dealers to decide when considering whether a car should be cut up whether it contains serviceable parts.

If it contains serviceable parts, the dealer must secure permission of the WPB Automotive Division to sell it for scrap. The Automotive Division is said to look upon the auto graveyards as important sources of auto parts, particularly because of the high-average age of vehicles on the road at present.

Salvage Division officials point out the dealers do not have the manpower to disassemble every car containing serviceable parts, and say that the order is too inclusive with respect to the year and model of cars affected. Furthermore, these officials declare, the auto graveyard dealer's interest in getting the highest return on the cars he owns would prompt him to pursue a sound policy in regard to selling cars for scrap. Dealers know that a car sold for parts brings more than one sold for scrap.

The Salvage Division, which does not want to cripple transportation, says that it might help if the word "saleable" were substituted for the word "serviceable." But, these officials admit that this substitution could well lead to confusion. A part considered saleable in Florida might not be saleable in New York.

In connection with this proposal, the suggestion has been made that there be a country wide movement of parts of the old cars. This idea has been dropped because it is deemed impractical, if not impossible. To collect and tag all used car parts which conceivably might have a sale in different parts of the country could not be done. Difficulty of identification is said to be the major factor in the decision to abandon this idea.

The Salvage Division favors abandonment of control over this activity because of the obvious stumbling blocks, the red tape, and the slowing down effect of scrap movement. The idea of adopting a date as the deciding factor has received opposition because some states have higher average-age cars than others.

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Materials in Welding Electrodes Limited

Washington

• • • **The use of certain critical** materials in the manufacture of spot welding electrodes is restricted and simplification and standardization practices are established by General Conservation Order L-318 issued last week by WPB.

Fitting ends for spot welding electrodes must be machined for specified sizes, except when the buyer certifies that the electrodes are needed for use in pulsation welding. The manufacture of straight spot welding electrodes is limited to over-all lengths and maximum diameters as specified in Schedule A attached to the order.

Provisions governing the use of critical materials prohibit the use of tungsten, molybdenum or metallic mixtures containing these metals, except in electrode facings, and inserts; and permit the use of copper base alloys of cadmium, chrome, beryllium-colbalt and beryllium-nickel only to the extent specified in Schedule B.

Effective date, Oct. 7; materials in producers' hands on Sept. 7, are exempt from the restrictions on critical materials.

Additional CMP Developments

• Reg. 9 permits retailers, electricians, radio repair men and others who sell copper wire to the general public to purchase limited quantities and sell it to the public without restriction. (Release No. WPB-4207)

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• Dir. 26 to Reg. 1 outlines the method whereby allotments of controlled materials may be returned by a sub-contractor.

•

• Dir. 22 to Reg. 1 limits the time of granting special allotments to the third and fourth quarters of 1943 and to the first and second quarters of 1944.

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• Int. 16 to Reg. 1 defines the methods permitted in furnishing materials to sub-contractors. These alternative methods apply only to the manufacturer of class A products.

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• Dir. 27 to Reg. 1 defines the right of a manufacturer to specify the allotment quarter. This applies to the manufacturer of a class A product.

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• Dir. 28 to Reg. 1 covers the replacement of controlled material lost or stolen in transit.

WPB Announces New Steel Controls Committee

• • • **The WPB last week announced** formation of a Steel Controls Industry Advisory Committee. Its members are:

Government presiding officer: W. A. Hauck. Committee members: William Bonte, Republic Steel Corp., Cleveland; F. R. Brugler, Bethlehem Steel Co., Bethlehem, Pa.; E. L. Resler, Jones & Laughlin Steel Corp., Pittsburgh; Neele E. Stearns, Inland Steel Co., Chicago; H. C. Stringfield, U. S. Steel Corp. of Delaware, Pittsburgh.

One more member, to be selected shortly, will be added to the committee.

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OPA Formula Continued For Pricing Steel Flanges

Washington

• • • **The special formula** for pricing cast steel flanges, forged steel flanges, and flanges made from steel plate promulgated by OPA last June may be used until Nov. 1. Use of the formula was to have stopped after Aug. 31, according to Maximum Price Regulation No. 188, OPA.

The extension was contained in Amendment 12 to Order A-1 under Regulation No. 188, and is effective on Aug. 31.

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WORLD'S FINEST METALLIZING EQUIPMENT

Brazil, Giant of South, Now Expanding

(CONTINUED FROM PAGE 104)

Although Brazil's present status represents merely a good start, nevertheless it now makes its bid as possessing the greatest industrial potential of any nation in South America.

The industrial expansion in Brazil during recent years has been particularly noticeable in the large population centers such as Rio de Janeiro, with a population of 1,781,000 (in 1763, it was 30,000), and Sao Paulo, second city of Brazil, with a population of 1,318,000, live in a radius of 125 mi. from the city of Sao Paulo.

A group of financiers in Sao Paulo is endeavoring to build an aluminum refining plant and to get the necessary equipment from the United States. They claim they have a high-grade bauxite deposit as well as an abundance of hydroelectric power located conveniently near the city. They also maintain that they have the necessary local skilled technicians to operate the aluminum plant.

Brazil has already made considerable progress in the exploitation of its large deposits of bauxite and development of an aluminum industry.

One establishment under construction has a rated capacity of 5000 to 6000 tons of aluminum annually. Initial production of metallic aluminum is expected to amount to 2000 tons annually. Power will be furnished by a hydroelectric plant with a capacity of 14,500 horsepower.

Motives for these projects are the desire to exploit more fully Brazil's immense bauxite deposits, and to ship aluminum to the United States as a contribution to the war effort. In addition, the Government aims eventually to establish an aircraft-construction industry based on its own aluminum supplies, and to turn out cargo planes capable of transporting heavy loads of relatively valuable merchandise from the more inaccessible parts of the interior to the coast, thereby solving the country's most serious problem — inadequate transportation facilities.

Brazil has 81 known deposits of bauxite, estimated at about 150,000,000 tons.

The major industrial project now under construction in Brazil is the National Steel Mill. It is located at Volta Redonda in the State of Rio de Janeiro near the border of Minas Gerais, about 90 miles from Rio de

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We are proud of the savings this preventive protection means to America at any time, but particularly so in war time when the conservation of steel is so vital.

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CHASING RAINBOWS?

Industrial progress has always started with ideas, with visions that may seem to be unreachable. Chasing rainbows is a perfectly proper function of industrial planning—*if* it is tempered with common sense and judgment.

We shall inherit from war production a wealth of new materials and techniques, which will make possible the building of better, more efficient and less costly manufactured products.

Many of today's models will become obsolete. However, their ultimate successors, as envisioned by practical "rainbow chasers", will not arrive overnight. They must first be tested and proved and improved—a process that requires time.

Industry will have an almost infinite choice of materials and methods for postwar products. But remember that word "choice". Selection is not automatic; alternatives must be studied, and decisions based on sound, provable engineering facts, always tempered by cost and ultimate selling price.

In working for many manufacturers, building an infinite variety of products, Trundle engineers have acquired an exceptional background of experience in the use of new materials and techniques. This fund of practical knowledge is available to you in your planning for the future. Would you like to discuss it with us?

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Janeiro and 220 miles from Sao Paulo. The plant is expected to produce 300,000 tons of steel and 50,000 tons of pig iron annually, which would amount to about half of Brazil's past annual steel requirements. The new plant will have two open-hearth steel furnaces and six blast furnaces capable of handling 800 tons of ore daily, and using 150 tons of coke produced from coal obtained from the State of Santa Catarina.

The plant will also produce as by-products sulfate of ammonia, toluol, benzol, heavy and light oils, tar, and basic products for chemical industries.

Achievements At Volta Redonda

The United States is at present providing the Volta Redonda steel plant with materials for constructing the blast furnaces, coke ovens, open-hearth furnaces, and rolling mills, along with other equipment.

Volta Redonda is south of the Serra do Mar and is served by a main line of the Central Railroad of Brasil. The plant site is comparatively level despite the hilly nature of the region. The mill is close by the Paraiba River.

AT ORDNANCE SHOW: Major General L. H. Campbell, Jr., Chief of Ordnance, pauses before a.c.f. shell display to ask a question of Mrs. Almira Linnenbank who operates the tank turret at American Car & Foundry Co. exhibit in the Philadelphia "Ordnance for Victory" show.

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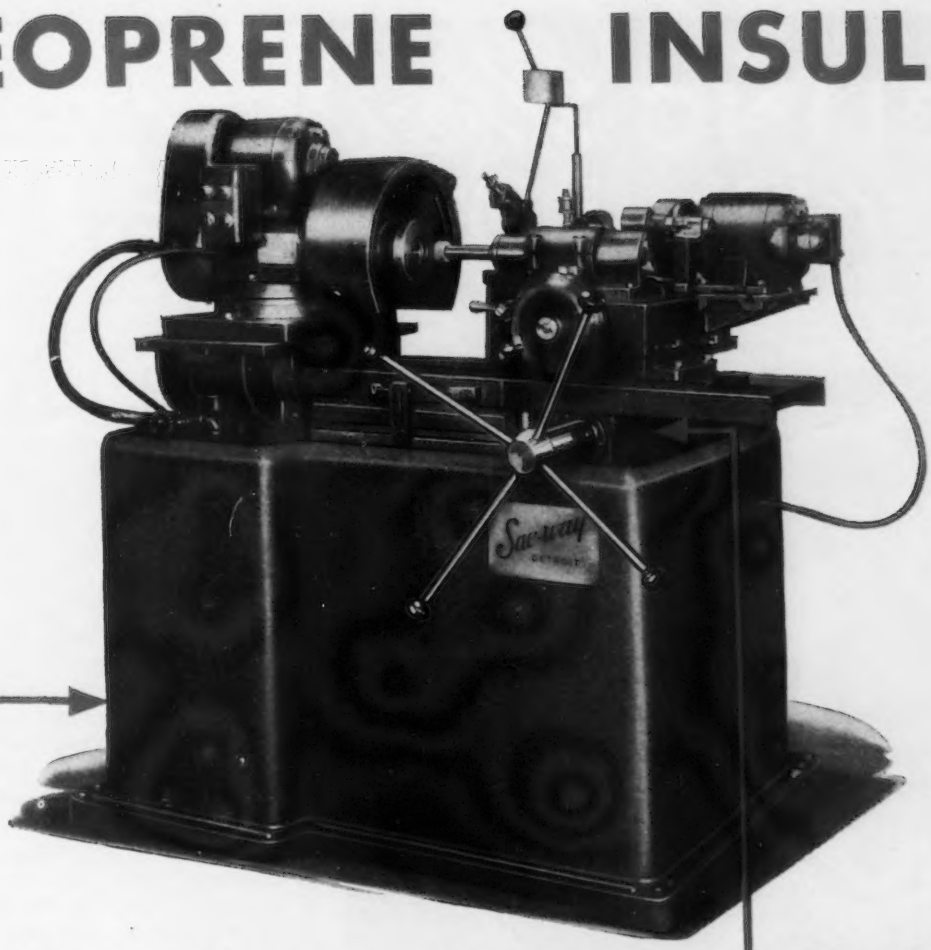

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This radical departure from conventional design gives the Sav-Way multi-purpose internal grinder a new permanence of alignment and resulting higher accuracy. The bed proper is a thick surface-plate type normalized alloy iron casting of heavily ribbed whale-back construction. Neoprene pads between the bed and the steel base eliminate metal-to-metal contact and absorb floor vibration, preventing distortion of the base being transmitted to the bed, which is accurately scraped. This is only one of seventeen specific features which make the new Sav-Way M-1-A Grinder outstanding in design and construction.

For complete description and specifications, attach the coupon to your letterhead.

Send the Coupon for Your Copy

KEEP AN EYE ON

Sav-way INDUSTRIES

Machine Tool Division

4875 EAST EIGHT MILE - DETROIT, MICHIGAN

PRODUCERS OF SAV-WAY HAND AND HYDRAULIC INTERNAL GRINDERS • SAV-WAY GOLD SEAL SPINDLES • PLUG GAGES • PRECISION AIRCRAFT AND AUTOMOTIVE PARTS

SAV-WAY INDUSTRIES, 4875 E. 8-Mile Road
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Kindly send me a copy of the illustrated folder describing the Sav-Way M-1-A Internal Grinder.

Name_____

Position_____

Firm_____

Address_____

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ROEBLING *Wires*

ROUND . . . FLAT . . . SHAPED

GUNS SOMETIMES JAM if ammunition and clips are not right—and the rolling of the Roebling flat wire that is formed into those clips is an exacting job.

Dimensions, steel analysis, temper, finish must meet specifications on the nose on this and scores of other jobs for Roebling wires.

Roebling mill facilities, experience and know-how are just as ready to lick your problem, deliver a wire stock that's right, and ready for final fabrication. Can we save you some time and trouble?

JR ROEBLING

JOHN A. ROEBLING'S SONS COMPANY

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which will provide an ample supply of water. The plant will have an over-all length of about 3 miles.

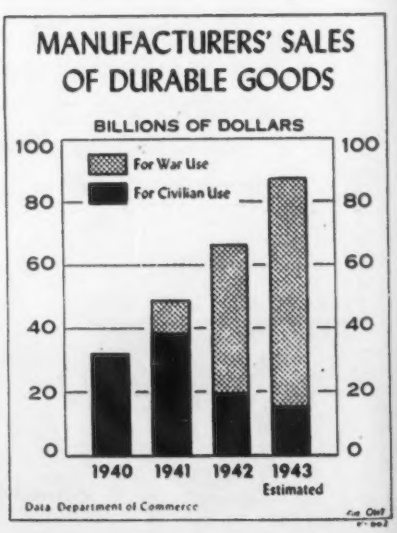
On the side of the valley slope above it, the model town of Volta Redonda is being built, with preliminary facilities for housing 10,000 persons. As the steel mill will employ about 4000 workers, it is expected that the community will be fully occupied from the start.

Developing Itabira's Iron

Brazil's industrial expansion will be further augmented by a $14,000,000 credit provided by the United States and repayable in 25 years, for the purpose of exploiting the high-grade iron ore of the Itabira mines, believed to constitute the largest single deposit of iron in the world.

Under this agreement, recently signed by Brazil's Minister of Finance and the Export-Import Bank of Washington, the credit is given to the Vale do Rio Doce Co., the Brazilian corporation which took over the iron-mine operations from the British interests, to step up development of the famed deposits. Brazil, to date, has contributed approximately $10,000,000 toward this project, making an aggregate allocation of about $24,000,000 for this work. This accord will provide the United States and British steel industries with high-grade iron ores. Thus Brazilian reserves will be the largest source of iron available to the United Nations to offset the loss to the Axis of high-grade ores in Sweden, France, and the U.S.S.R.

Some of the Itabira ore is also expected to be used for Brazil's own future steel requirements. The shipping shortage in particular has made



RAMTITE PRODUCTS SERVE EVERY INDUSTRY USING HEAT

JUST THE RIGHT REFRACTORY FOR HEAT TREATING FURNACES

RAMTITE PRODUCTS

Ramtite Plastic Refractory ... in three grades

Fracto-Crete and Mono-Cast castable refractories

Esso Bond air set refractory mortar

Hot patch heat set refractory mortar

Esso (silicon carbide base) patching and ramming mixes

Safe-tie Refractory Anchors

RAMTITE is ideal for lining Heat Treating Furnaces because (1) it is installed in plastic form and is easily shaped to the proper furnace contour; (2) its resistance to fluctuating temperatures is outstanding; (3) it has a high insulating value; (4) its smooth, dense surface gives maximum reflection of heat to work; (5) there are no joints through which heat can escape; (6) it has an exceptional combination of engineering properties.

Ramtite was used for the side walls and hinged roofs of this normalizing furnace for flame cut steel shapes. A typical Ramtite installation. Send for a bulletin describing the engineering properties of Ramtite.

THE RAMTITE CO. ..... *Division of The S. Obermayer Co.*
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RAMTITE

PLASTIC REFRACTORY

JOEY ON-THE-JOB SAYS...

"I give 'em a beating . . . and then wash 'em up and they're ready for MORE!"

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REGULAR INDUSTRIAL GLOVES

They wear longer—taking the roughest handling and giving as much as *7 times the service* of ordinary work-gloves. A special knit in the Jomac Fabric makes this extraordinary wear possible. This hidden lock-stitch keeps the thick pile in place . . . and gives thousands of sturdy "cushions" which provide a semi-heat-resisting glove that protects the hands . . . allows a breathing-space to make possible the handling of reasonably hot metals. Endorsed by leading American shops and foundries.

And Jomac Gloves can be laundered, too. They are easy to wash, easy to keep clean . . . a safeguard against the dangers of dermatitis and other skin infections.

(Jomac also makes the famous Heat-Resisting Gloves.)

TEST THEM!

Just try JOMAC GLOVES on your stiffest jobs. Test them for wear, for washability, for economy, for *increased production*. Write for *full* details.

JOMAC

INDUSTRIAL GLOVES

C. WALKER JONES CO.

6135 N. Lambert Street, East Germantown, Philadelphia 38, Penna.

it urgent that Brazil increase its self-sufficiency in such basic items as steel so that the country may proceed with the development of its gigantic resources of raw materials.

The Brazilian reserve has been estimated to amount to nearly 25 per cent of the world's known iron ores. The largest ore bodies, running into billions of tons, lie chiefly in the area drained by the headwaters of the Rio Doce in the State of Minas Gerais. Surface ore bodies are from 1000 to 2000 feet long and as much as several hundred feet wide. They are massive, compact deposits, containing from 67 to 69 per cent of iron, or some 10 per cent more than the deposits of the Mesabi iron-ore mines that furnish the bulk of the ore for the United States iron and steel industry.

The ore mined in Itabira will be transported by railroad to the Atlantic port of Vitoria for export. A special conveyor belt that can load four vessels simultaneously and handle 7000 tons a day has been constructed at that port. Part of the $14,000,000 credit for the Itabira mine development is to be spent on rehabilitating the equipment of the 350-mile Vitoria-Minas Railroad and improving the port facilities at Vitoria so that 1,500,000 tons of iron ore annually may be moved from Itabira by the end of next year, with progressive increases thereafter. The Vitoria-Minas Railroad connects with the Central Railroad of Brazil, and also with the Leopoldina Railroad in Minas Gerais. The Bahia—Minas Railroad also is expected to be connected with the Vitoria-Minas Railroad.

At the request of the Brazilian Gov-

"THAT'S PERSPIRATION, MRS. VAN BUTTERWORTH"

It's New... Logan

QUICK CHANGE GEAR LATHE

with

FRICTION FEED AUTOMATIC APRON

Precision Built FOR SUSTAINED ACCURACY

The variety of work it handles... the speed, accuracy, and safety of its operation place this new lathe in a class by itself. It combines compactness, economy and versatility. With its friction feed automatic apron and precise construction throughout, this new Logan Quick Change Gear Lathe is by every standard a rugged, highly adaptable machine of sustained accuracy. Bed ways, for example, are precision ground to within .001" of absolute accuracy. Total run out of the headstock spindle 12 inches from the bearing is less than .001". The lead screw is held to within .002" in 12 inches. All moving parts are protected by ball bearings or by self-lubricating bronze bearings. As for economy, the new Logan No. 820 quickly pays for itself through lowered unit costs.

LOGAN ENGINEERING COMPANY · Chicago, Illinois

Brief Facts

- Swing over bed 10½"
- Bed length 43⅛"
- Spindle hole 25/32"
- Precision ground ways: 2 prismatic "V" ways; 2 flat ways
- 12 spindle speeds—30 to 1450 per minute
- Worm drive from lead screw spindle for power feeds
- Friction clutch on power feeds
- Longitudinal feed .0015 to .1000" per spindle revolution
- Cross feed .25 times longitudinal feed
- Half nut drive from lead screw thread for thread cutting

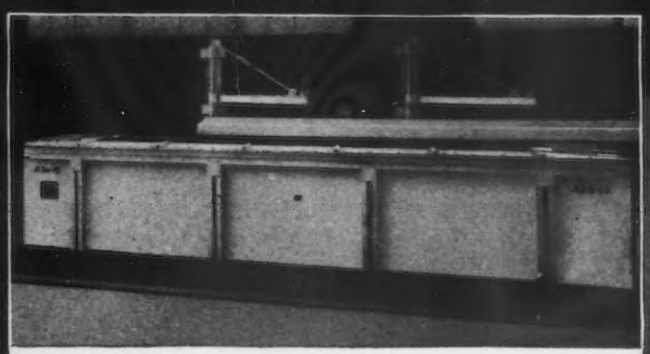
Threads—48 selections RH or LH—4 to 224 per inch

Logan

A NAME TO REMEMBER WHEN YOU THINK OF LATHES

Uniform Temperature + High Capacity with

R-S Salt Bath Furnaces



R-S pioneered in the development of Salt Bath Furnaces for the heat treatment of aluminum alloy parts. Some of these installations have been in continuous operation for fifteen years or more.

The exceptional results obtained in temperature uniformity with the consequential uniform physical properties, have convinced such customers that these furnaces have no equal for heat treating aluminum.

High capacity with minimum floor space is also an important consideration.

Small R-S Salt Pot Furnaces are used for tempering, the solution heat treatment of aluminum parts, and for hardening steel.

If you need additional facilities for heat treating aluminum aircraft parts or stampings, we shall be glad to submit detailed information on the equipment required.

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R-S PRODUCTS CORPORATION
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ANNEALING • PLATE AND ANGLE HEATING • FORGING
ROTARY HEARTH • METAL MELTING • CONVECTION
CAR HEARTH • CONTINUOUS CONVEYOR • SALT BATH

R-S Furnaces of Distinction

BUY WAR BONDS

ernment, three metallurgical experts have been appointed by the United States Government to spend three months each in Brazil to lecture on mining and metallurgical problems and to make field trips of study through the mining areas.

Dr. A. Allan Bates, manager of the chemical and metallurgical division of the Westinghouse Research Laboratories; Dr. Robert Mehl, head of the department of metallurgy at Carnegie Institute of Technology, and Arthur Phillips, Professor of Metallurgy at Yale University, are the experts appointed to undertake this task. They will work under the immediate supervision of the Stevens Institute of Technology and the Office of the Coordinator of Inter-American Affairs.

First to leave on his mission was Dr. Bates. He established headquarters in the University of Sao Paulo Polytechnic School.

Other Notes of Interest

Since 1930 the Brazilian Government has remodeled, enlarged, and

NAZI NET: British Navy's Boom Defense Branch is shown towing a huge net to sea as a barrier against Nazi marauders. *Wide World*

Safe on a new job... She's taking the place of a man at the front... doing his job... working his hours . . . needing added protection against dangerous slipping and falling accidents. "A.W." Rolled Steel Floor Plate speeds production because it's permanently skid-proof. Toughest wear will not damage or impair it. "A.W." Floor Plate protects men and women in the war effort, wherever they may be.

Other products include Plates, Sheets, Billets, Blooms, Slabs—Carbon, Copper or Alloy analyses.

ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS: CONSHOHOCKEN, PENNSYLVANIA : SINCE 1826. District Offices and Representatives: Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, St. Paul, New Orleans, Pittsburgh, Roanoke, Sanford, N.C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal.

You can't have spring quality and service without it!

PROPER BALANCE, timing and coordination between skilled employees, modern equipment and methods, and rigid production control are responsible for Accurate quality and service—to give you the springs and wireforms you want...*when you want them.*

From the specification stage through the precision manufacturing operations and the steps of testing and inspection, the Accurate organization works in smooth, production-building balance.

Accurate engineers, too, are specially trained to work hand-in-hand with your own engineers to produce the precise springs or wireforms for the job, thus eliminating waste motion, saving time, trouble and headaches.

We know you will like the friendly cooperation and product quality which you will find at Accurate. When you have spring and wireform problems, bring them to us.

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3819 W. LAKE ST. ★ CHICAGO 24, ILL.
SPRINGS ★ WIRE FORMS ★ STAMPINGS

Accurate Springs

re-equipped its munitions industries. The results of these activities are exemplified by the arsenal in Rio de Janeiro, which today is two and one-half times as large as, and more efficient than, formerly. Other munitions industries throughout Brazil show proportionate improvement, both in efficiency and in production.

The key to Brazil's industrial future is transportation, and in this field the administration has not been idle.

During the period between 1930 and 1940, 1060 miles of railroad were built by the Army, as well as approximately 1250 miles of highways. In addition, civilian works built 812 miles of railroads. All in all, roads and highways have increased from 70,797 miles in 1930 to 143,328 miles in 1940, more than doubling the mileage constructed prior to 1930. Also 934 major bridges were built between 1930 and 1940.

In the highway developments, Brazil's Federal and State highway programs are coordinated under a national plan, which is designed eventually to make all parts of the country accessible through a network of first-class roads.

Brazil's Central Railroad between Rio and Volta Redonda and the Sorocabana Railway System is now in process of electrification with the aid of United States credits. It is hoped that extension of this work throughout the length of the rail line will be undertaken to make one of the finest rail lines in the Western Hemisphere.

Considering the rugged topography in Brazil, the importance that air transport will play in Brazil's future is apparent. Brazil began to organize and develop its own aircraft-manufacturing industry in 1935. Since then scores of planes have been built by the Fabrica Brasileira de Aviones in Rio de Janeiro. These planes are used by Brazil's military air forces. A modern forward stride in Brazil's air power is the erection of an airplane-motor plant, known as the Fabrica Nacional de Motores, now being built near Rio de Janeiro under the able guidance of General Antonio Guedes Muniz. The Government has obtained a license to build United States Wright Whirlwind motors at this plant. The buildings, with 180,000 sq. ft. of floor space, will include a machine shop, factory offices, a foundry, a heat-treating plant, eight sound-proof test cells, and a reception center with a clinic for the 500 workers and their families. A modern community for workers and their families will be constructed near the plant.

DO-ALL *Cuts any material*

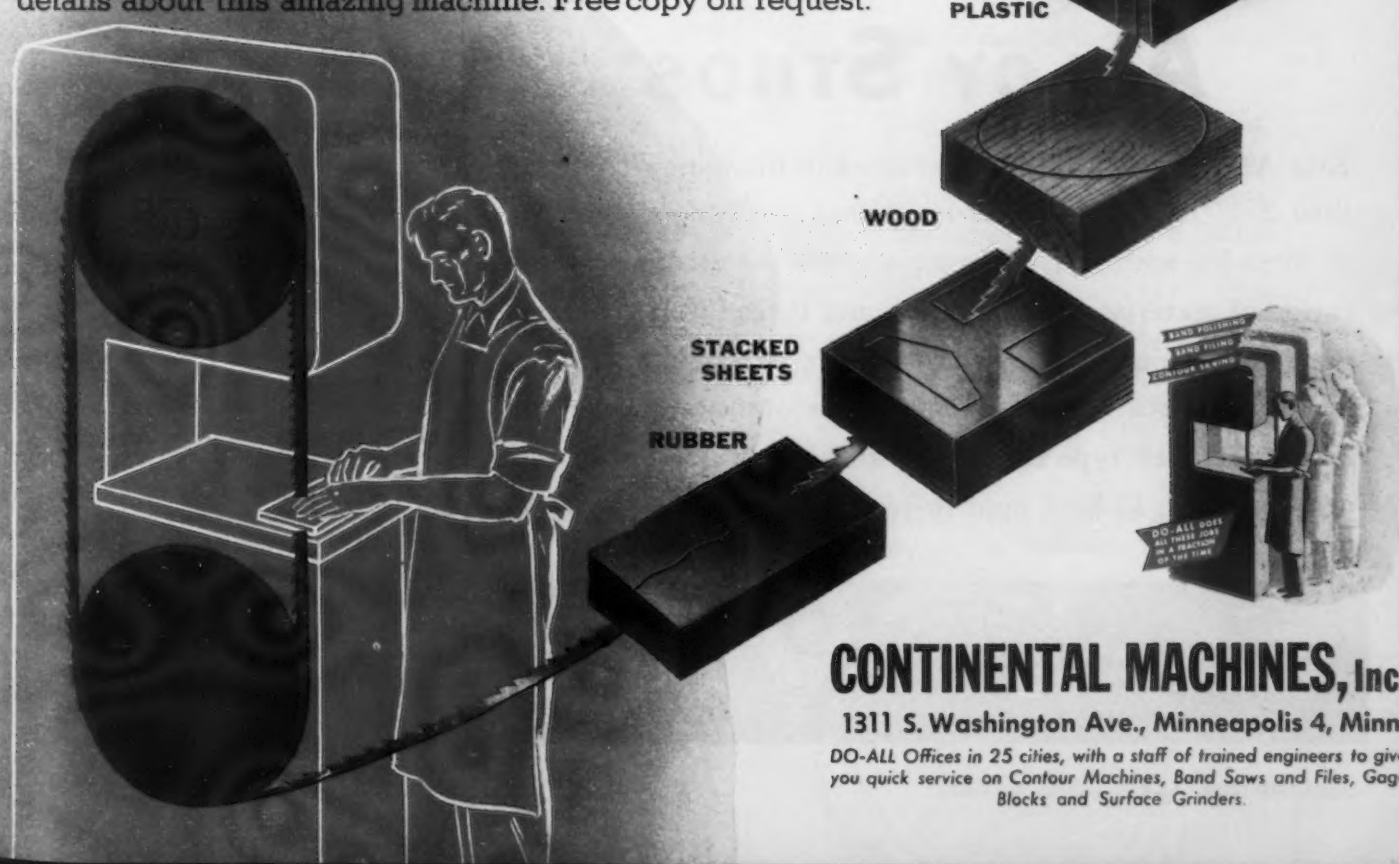
What have you that needs quick, smooth cutting—Metals? Alloys? Plastics? Plymetals? Rubber? Laminated Products? Composition Materials?

Armed with a DO-ALL Contour Machine and a supply of tough-edged DO-ALL Band Saws, you can tackle any internal or external sawing job — flats, bars, tubing, blocks a foot thick, stacked sheets, etc.

Just thread the DO-ALL with the proper band saw and you have ready for instant use Today's Fastest Machining Method—Meets the Challenge for Greater Production.

Six models — built for greater speed and a smoother finish — priced from $1,000 to $5,000 with motors.

Everyone interested in advanced shape cutting methods, should see the 265-page DO-ALL Handbook giving details about this amazing machine. Free copy on request.



CONTINENTAL MACHINES, Inc.

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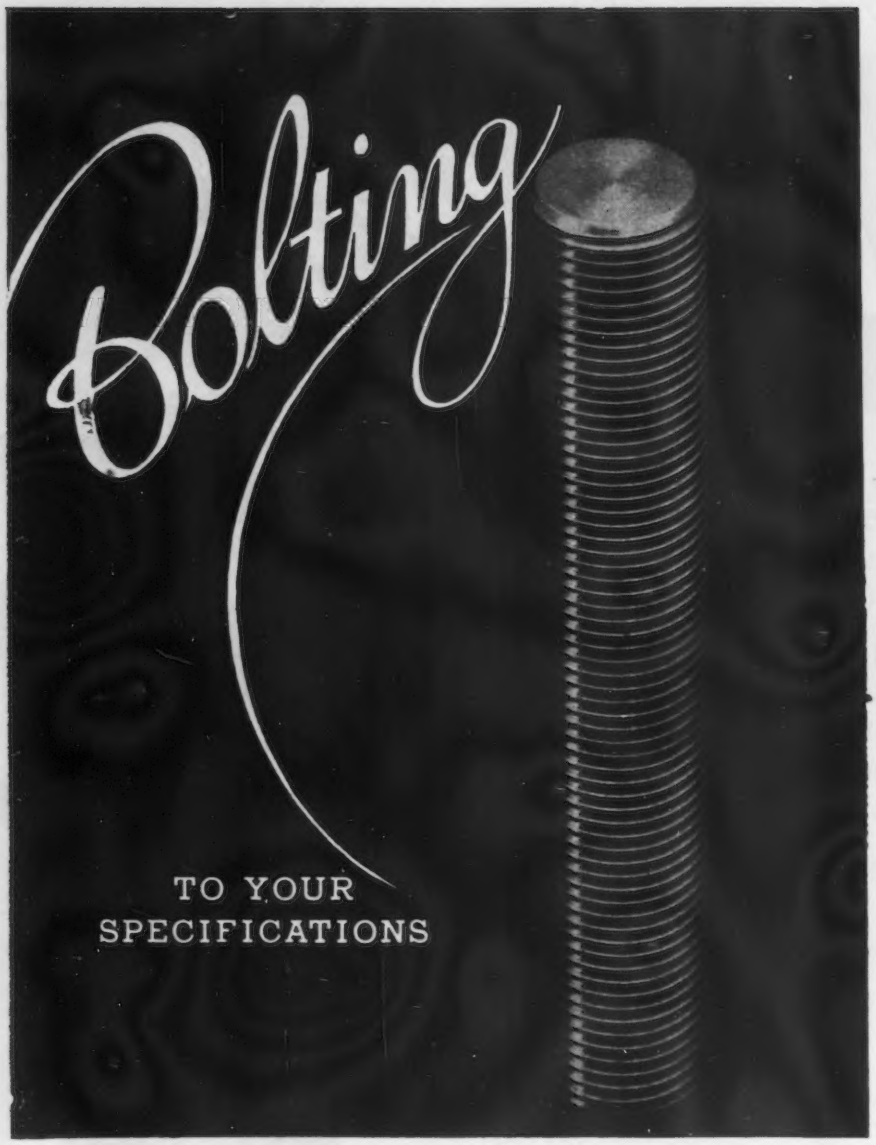
DO-ALL Offices in 25 cities, with a staff of trained engineers to give you quick service on Contour Machines, Band Saws and Files, Gage Blocks and Surface Grinders.



ALLOY STUDS

Erie Alloy Studs are manufactured in diameters from ½" thru 2½" in lengths to order, either continuous threaded or threaded each end. These are made to customer specification of material—heat treating and thread fit. Wherever pressure temperature or corrosion are determining factors in bolting we invite your request, for our experience is in this specialized type of bolting and any other out-of-the-ordinary type of bolt, stud or nut.

ERIE BOLT & NUT CO
ERIE, PA., U. S. A.

Canadian Steel Output Shows Minor Gain

Toronto

• • • **Production of iron and steel** in Canada showed a minor gain in July over the month immediately preceding, while for the seven months ending July 31, output of pig iron was down 12.4 per cent and steel 3.8 per cent from the all time high records made in the corresponding period last year. During July pig iron production averaged 70.8 per cent of capacity compared with 98.3 per cent in the same month last year, and output of steel ingots and castings was at the rate of 85.11 per cent against 89.5 per cent a year ago.

In July this year a new blast furnace at Sydney, N. S., was blown in by Dominion Steel & Coal Corp., Ltd., which brought the Canadian pig iron capacity to 2,348,160 net tons per year from 2,123,320 tons last year. Algoma Steel Corp. Ltd., Sault Ste. Marie, has completed its new blast furnace.

No change was reported in steel ingot and castings capacity during July, which totalled 3,453,600 net tons per annum against 3,402,000 tons in July, 1942, this rate since has been increased by about 100,000 tons by the starting of production of the new electric furnace by the Steel Co. of Canada Ltd., Hamilton.

Officials of the Steel Co. of Canada Ltd., are giving consideration to plans for post-war construction for a large strip mill at the Hamilton works.

For July production of pig iron amounted to 151,369 tons and included 127,733 tons of basic iron, which compares with 172,153 tons in July, 1942. For the seven months ending July 31, pig iron output totalled 1,019,158 tons compared with 1,146,153 tons in the same period 1942.

Output of ferroalloys in July rose to 21,408 tons from 18,151 tons in June and 15,961 tons in July, 1942. For the seven months ending with July production totalled the high record of 133,201 tons compared with 124,561 tons in the corresponding period of 1942.

Production of steel ingots and castings in July at 250,508 tons compares with 239,501 tons in June and 256,560 tons in July, 1942. For July last output included 239,968 tons of ingots and 10,850 tons of steel castings. Cumulative production for the first seven months this year totalled 1,749,661 tons compared with 1,815,798 tons in 1942.

Yes WE DELIVER ON TIME

No holding up vital jobs while you wait for your grinding wheels or mounted wheels*.

Timing and scheduling are everything now. That's why our streamlined QUICK SERVICE is such an important asset.

Fully approved and endorsed by W P B, here's our wartime speed setup:

- Manufacture only wheels 3" in diameter and under. To speed production, larger sizes are eliminated for the duration.
- No quitting whistle. We are on the job making wheels 24 hours a day, every day.
- Our central location brings us closer to many plants. No time lost in transfer connections or long distance shipping.

CHICAGO GRINDING WHEELS

The wheels of proved quality—known for performance, cutting and long life.

Any shape, grain and grade, any size up to 3" in diameter. From this army of wheels you can select one custom built for your job.

AMERICA'S HEADQUARTERS FOR MOUNTED WHEELS SMALL GRINDING WHEELS

*Half a century of specialization has established our reputation as the Small Wheel People of the Abrasive Industry You can bank on us.

TRY ONE—Tell us the kind of equipment, the job, and size wheel you want to try. We'll send it postpaid.

Catalog Mailed on Request

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Send Catalog.
Interested in
☐ Grinding Wheels
☐ Mounted Wheels
☐ Send Test Wheel
Size.....

RA-9

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WPB Issues Revised Program Symbols; Serve As Guide to Fourth Quarter Plans

• • • **WPB has issued a revised list of the Official Program Identification Symbols for Claimant Agencies and WPB Industry Divisions. This list gives a good picture of what is scheduled to be manufactured during the fourth quarter, and makes it easy to identify the uses to which material will be put.**

The list of symbols is in two parts: the first contains the Claimant Agency programs and the second gives the Class A Civilian Type Products and the Class B Products of the WPB Industry Divisions.

This list supersedes the CMP Program Identification Symbols Table issued several months ago.

OFFICIAL PROGRAM IDENTIFICATION SYMBOLS FOR CLAIMANT AGENCY PROGRAMS

Aircraft Resources Control Office

- C-1 Airframes and accessories.
- C-2 Ground and deck equipment and miscellaneous.
- C-3 Propellers and accessories.
- C-4 Engines and accessories.
- C-5 Construction and facilities.
- C-6 ARCO—"B" products.

War Department

- O-1 Ammunition—over .60 caliber.
- O-2 Artillery.
- O-3 Small arms material.
- O-4 Small arms ammunition.
- O-5 Tanks, armored cars and self-propelled mounts.
- O-6 Other tank automotive divisions.
- O-9 Miscellaneous and expendable ordnance.
- W-1 International Supply Division; Office of Scientific Research and Development; Special Service Division, Headquarters, A. S. F.; Office of Strategic Services; and Panama Canal.
- W-2 Office, Chief of Engineers—Construction Division.
- W-3 Chemical Warfare Service.
- W-4 Office, Chief of Engineers—Supply Division.
- W-5 Medical Department.
- W-7 Office of the Quartermaster General.
- W-8 Signal Corps.
- W-9 Transportation Corps.

Navy Department

- N-X Electronics Division. (This symbol is never passed on to consumers.)
- N-0 Bureau of Personnel.
- N-1 Ordnance (other than ammunition).
- N-2 Supplies and Accounts.
- N-3 Aeronautics.
- N-4 Ordnance Ammunition.
- N-5 Yards and Docks.
- N-6 Ships.
- N-7 Medicine and Surgery.
- N-8 Marine Corps.
- N-9 Coast Guard.

Maritime Commission

- M-1 Emergency cargo.
- M-2 Standard cargo.
- M-3 Tankers.
- M-4 Minor non-military vessels.
- M-5 Escort vessels.
- M-6 Aircraft carriers.
- M-7 Transport & other military vessels.
- M-8 Ship repair.
- M-9 Other equipment and supplies.
- M-0 Construction and facilities.

Office of Lend-Lease

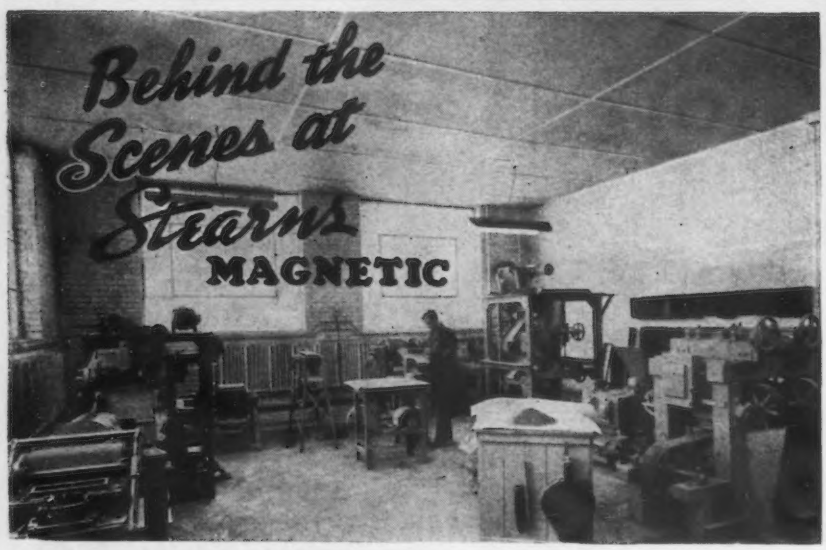
- L-1 U.S.S.R.
- L-2 United Kingdom.
- L-3 Lend-Lease areas other than those included in L-1, L-2 and L-4.
- L-4 Other British Empire, excluding Canada.

Office of Economic Warfare

- E-1 (All programs).

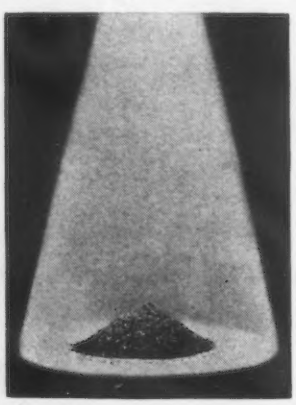
War Food Administration

- A-1 Food containers (can and closures).
- A-2 Agricultural machinery.
- A-3 Food production and distribution, and other programs.



Stearns Magnetic Milwaukee maintains extensive laboratory facilities, a corner of which is shown above. It is available for testing every variety of material sent in by interested engineers in mines and factories who want our assistance in solving processing or producing problems with magnetic equipment efficiently, automatically, profitably.

These Stearns Magnetic laboratory facilities represent a substantial investment in space, equipment, technical operation and supervision, a service that has again and again proved itself of inestimable value to all industries. Whether your material requires a simple magnetic separation process for reclaiming or purifying, or the most difficult magnetic concentration — whether it be liquid or solid—whether you wish to protect and insure continued quality of your product against contamination by tramp iron or other harmful magnetic ingredients that might bring law suits — protect employes and machinery — these are only few of the many necessities for Stearns Magnetic equipment.



We would suggest you investigate Stearns Magnetic methods. Write for our Bulletin 800.

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635 S. 28th St. Milwaukee 4, Wis.

SEPARATORS—CLUTCHES—BRAKES—DRUMS—MAGNETS

These Coils spell **DEADLY DANGER** *for the Axis!*

Innocent enough in appearance . . . these coils of strip steel clad with gilding metal. Their color makes a pretty picture, too. But you're looking at sudden death for the enemy.

Jackets for *x*-millions of United States bullets are made each day from this SuVeneer* Clad Metal. Formerly, such jackets were made of solid gilding metal. Now, they are composed of steel strip clad on both sides with gilding metal by Superior's unique process—*saving thousands of tons of strategic copper every month!*

We have permitted the use of this process to a score of other steel makers without charge for the duration—greatly swelling the tide of war production. SuVeneer Clad Metal provides an inseparable bond between steel and other ferrous and non-ferrous alloys—on one or both sides, in any thickness desired. It is a material holding great promise for peacetime design engineering.

*Trademark Reg. U. S. Pat. Off.

Superior Steel
CORPORATION
CARNEGIE · PENNSYLVANIA

"AUTOMATICS"

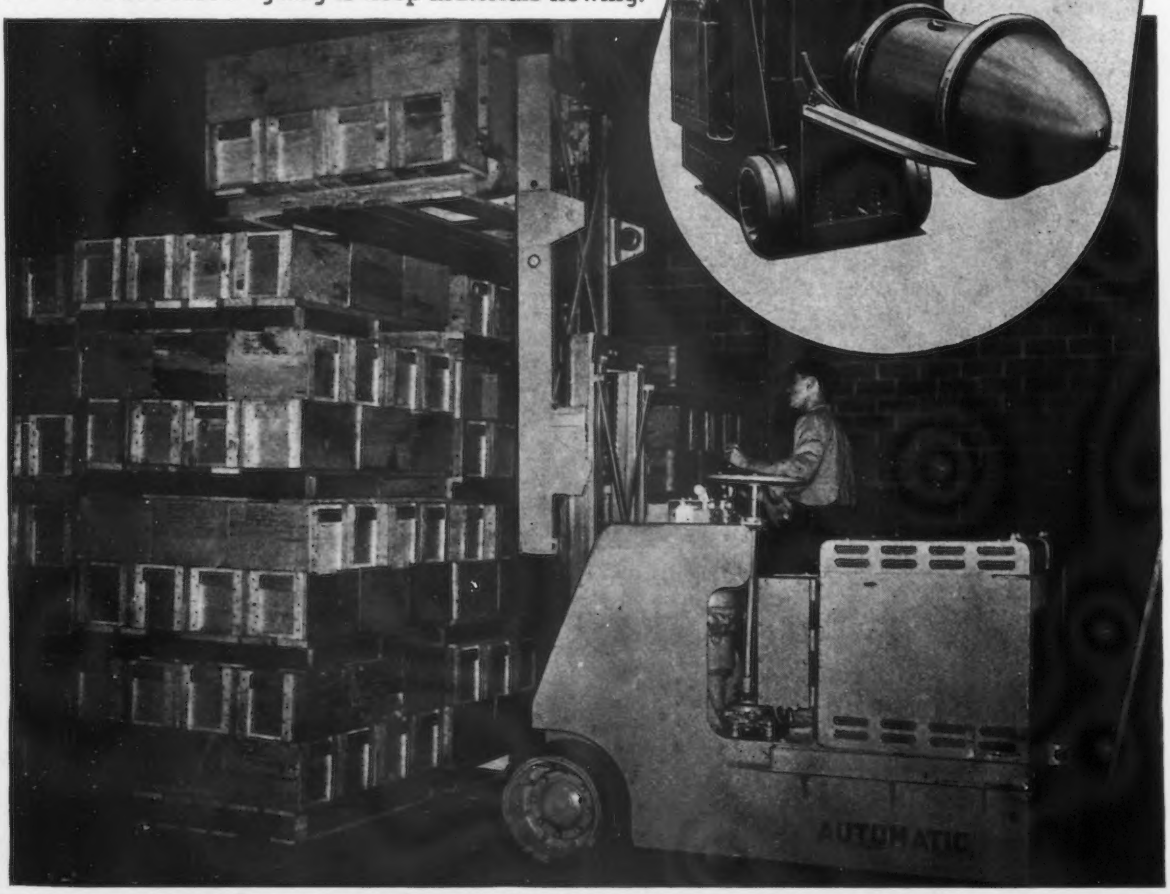
All of us are working for a quick victory

★ You in your way—we in ours—are extending ourselves to the limit to shorten the road to victory.

It is obvious that materials handling is a most important part of the war effort and to us is assigned the task of getting materials handling equipment to those places where it will do the most good.

Naturally we regret the situation that makes it necessary for so many of our customers of long standing to be denied new "AUTOMATICS" for the present. Yet, all of us are happy to cooperate in our own way for in this united action comes victory. One of these days there will come an end to the "for the duration" period and "AUTOMATICS" will again be available. Meanwhile, since we are "all out for war production" and your victory efforts too are being contributed—keep your "AUTOMATICS" going to keep materials flowing.

"Pass" THE AMMUNITION



MANUFACTURERS FOR OVER THIRTY FIVE YEARS *Electric Propelled* INDUSTRIAL TRUCKS

AUTOMATIC TRANSPORTATION CO.

DIV. OF THE YALE & TOWNE MFG. CO.

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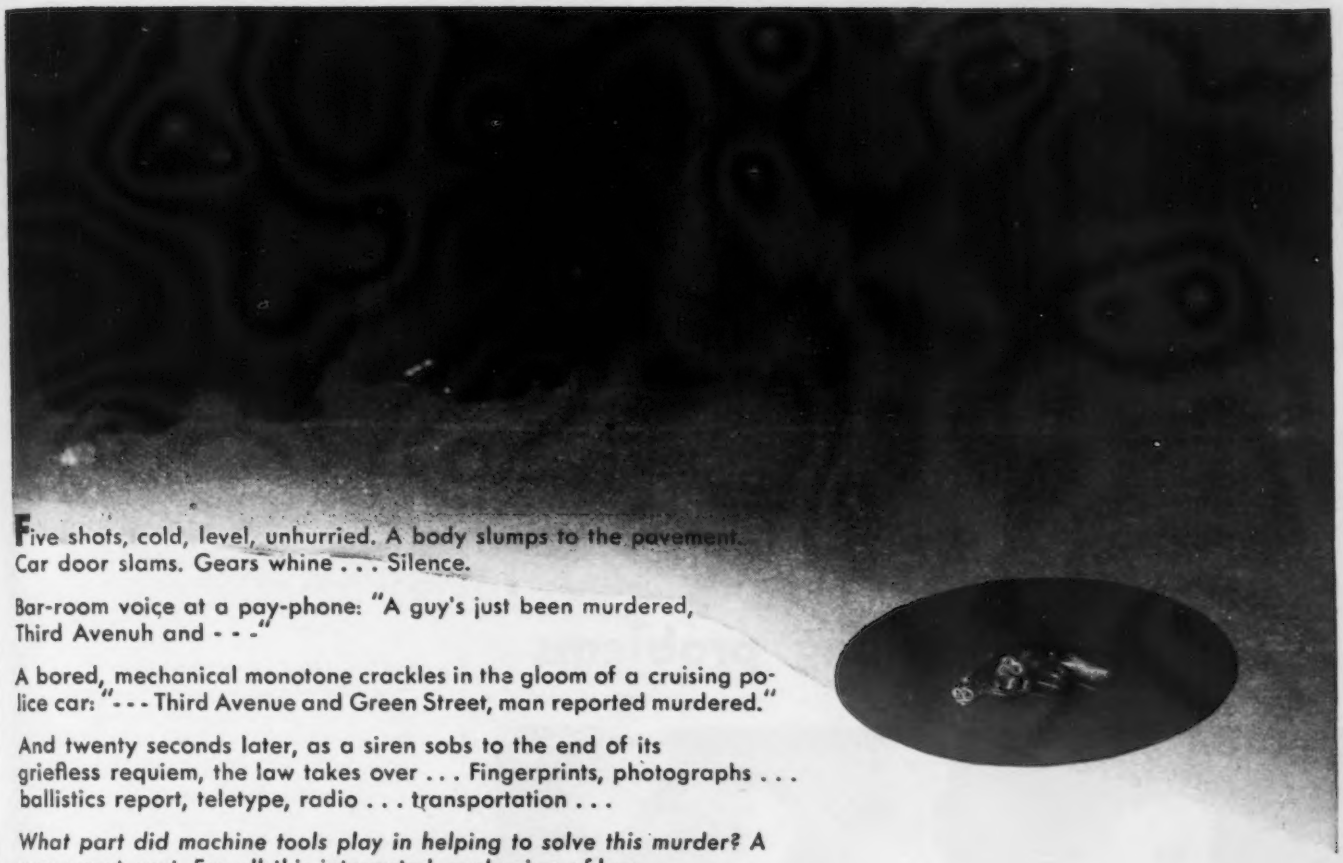


Five shots, cold, level, unhurried. A body slumps to the pavement. Car door slams. Gears whine . . . Silence.

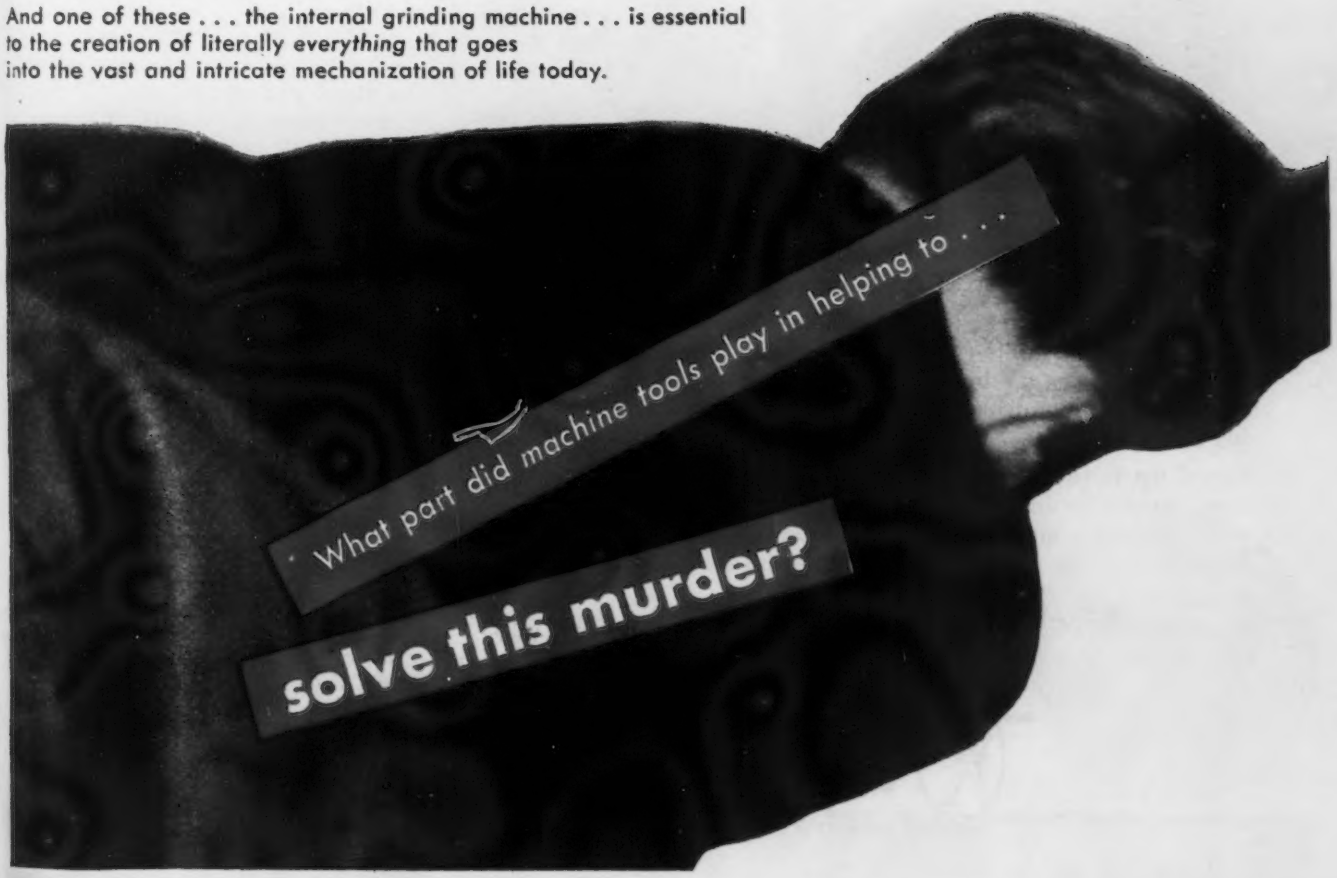
Bar-room voice at a pay-phone: "A guy's just been murdered, Third Avenuh and - - -"

A bored, mechanical monotone crackles in the gloom of a cruising police car: "- - - Third Avenue and Green Street, man reported murdered."

And twenty seconds later, as a siren sobs to the end of its griefless requiem, the law takes over . . . Fingerprints, photographs . . . ballistics report, teletype, radio . . . transportation . . .

What part did machine tools play in helping to solve this murder? A very great part. For all this integrated mechanism of law and order and justice was made possible by a relatively few basic precision machine tools.

And one of these . . . the internal grinding machine . . . is essential to the creation of literally *everything* that goes into the vast and intricate mechanization of life today.



BRYANT

BRYANT CHUCKING GRINDER CO. SPRINGFIELD VERMONT, U.S.A.

National Housing Agency

H-1 (All programs).

Petroleum Administration for War

P-1 "A" products and construction and facilities.
P-2 Special "B" products.
P-3 Maintenance, repair and operating supplies.
F-5 Hi-Octane expansion program.

Office of Rubber Director

R-1 Construction and facilities.
R-2 Special "B" products.
F-4 Synthetic rubber expansion program.

Office of Defense Transportation

T-1 Railroad locomotives.
T-2 Railroad cars.
T-3 Other railroad programs.
T-4 Local transport.
T-5 Motor transport (rubber-borne vehicles except buses).
T-6 Waterways.
T-7 Maintenance, repair and operating supplies for railroads.

Office of War Utilities

U-1 Miscellaneous utility-type "B" products.
U-2 Utility construction and facilities.
U-3 Transformers.
U-4 Switchgear.
U-5 Condensers.
U-6 Communications equipment.
U-7 Land boilers, etc.
U-8 Repair parts, power and communications equipment.
U-9 Maintenance, repair and operating supplies.

Office of Operations Vice-Chairman

S-2 Construction and facilities.
S-6 Special "A" allotment account.

Aluminum Div. (As Claimant Agency)

F-3 Aluminum and magnesium expansion program.

Mining Div. (As Claimant Agency)

F-1 Carbon steel expansion program.
S-7 Maintenance, repair and operating supplies.

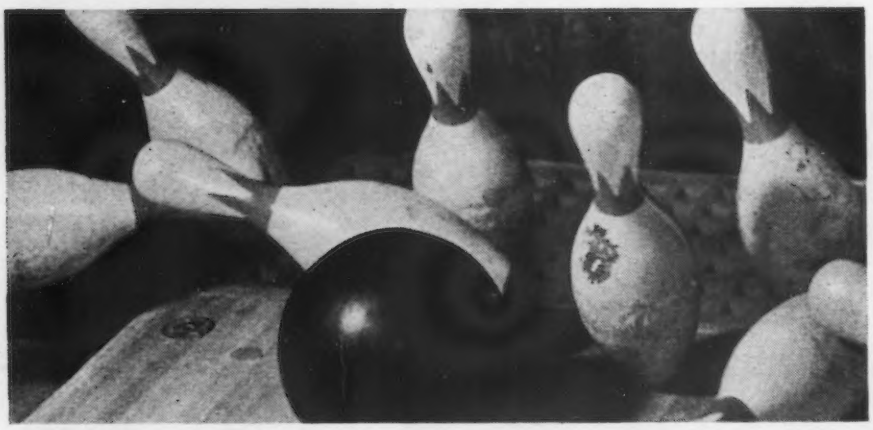
Steel Div. (As Claimant Agency)

F-1 Carbon steel expansion program.
F-2 Alloy Steel expansion program.
S-8 Maintenance, repair and operating supplies.

Office of Civilian Requirements

V-1 OCR Class B products and Civilian Type A products.
V-2 Construction and facilities.
V-3 Maintenance, repair and operating supplies.

Here's how Wyandotte *bowls over* your metal-cleaning problems



A ten-strike for Wyandotte Products . . . that's the verdict of those in charge of metal cleaning, everywhere!

And why not? Wyandotte has been the established headquarters for up-to-the-minute cleaning products for years . . . just as it's been a recognized source of valuable know-how and technical assistance in metal-cleaning problems.

Speed up is the universal "must" in wartime production, especially in vital metal industries. Wyandotte metal cleaning and degreasing compounds keep pace. They deliver top cleaning results at a minimum of cost.

Whatever your problem, call in the Wyandotte Representative. His rich mine of technical experience and information is ever at hand for you.

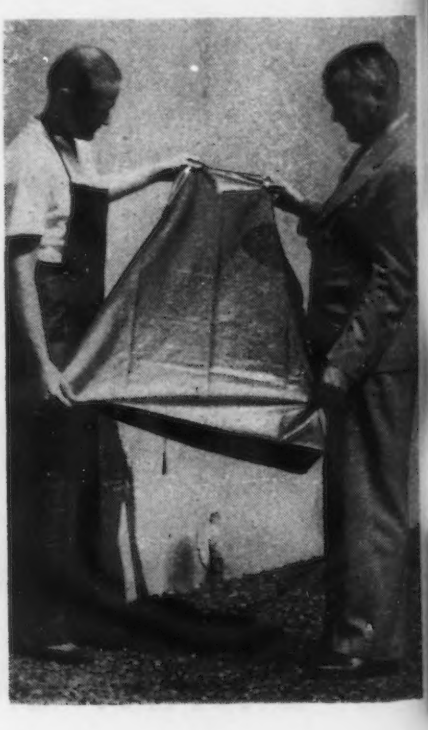
Wyandotte

SERVICE REPRESENTATIVES IN 88 CITIES

Wyandotte Chemicals Corporation ★ J. B. Ford Division, Wyandotte, Michigan

Wyandotte Chemicals Corporation consolidates the resources and facilities of Michigan Alkali Company and The J. B. Ford Company to better serve the nation's war and post-war needs.

RUBBER SUBSTITUTE: A new work apron of plastic "Resistite," which will replace rubber aprons, was invented by a lathe operator at Otto Aviation Corp. and will be produced by Nu-Lite Mfg. Co., Verona, N. J.



METAL SPECIALTY

fulfilling exacting requirements for

INDUSTRY

in

PLASTIC MOLDING

and

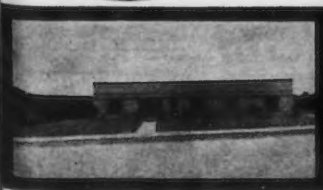
METAL WORKING

Drawing · Coining
Rolling · Forming
Stamping · Welding

Metal Specialty's plants are equipped to render you complete service in the fabrication of all Metal Parts, and in Plastic Injection Molding up through 18 ounces per shot. Along with 850-ton self-contained hydraulic presses for Metal Working, Metal Specialty has one of the four 18-36 ounce capacity injection presses for Custom Molding together with full complementary equipment.

Assembled Jobs · Pressed Metal to Order

ARMY E NAVY



The
METAL SPECIALTY *Co.*
MAIN OFFICE AND PLANT • ESTE AVENUE • CINCINNATI, OHIO

OFFICIAL PROGRAM IDENTIFICATION SYMBOLS FOR CLASS "A" CIVILIAN TYPE PRODUCTS AND WPB INDUSTRY DIVISION CLASS "B" PRODUCTS

ALUMINUM & MAGNESIUM DIV.

S-5	990	Aluminum alloying, deoxidizing, etc.

AUTOMOTIVE DIV.

Class "A" Civilian Type Products

S-9	763	Trucks and truck tractors.
S-9	764	Off-the-highway vehicles.
S-9	765	Truck trailers.
S-9	766	Automotive bodies and cabs.
S-9	767	Third axle attachments.
S-9	916	Motorcycles.

Class "B" Products

B-1	105	Auto accessories and replacement parts.
B-4	106	Brakes.
B-4	108	Wheel assemblies.
B-4	135	Carburetors.
B-2	136	Internal combustion engines.
B-3	156	Bearings, babbitted, common, etc.
B-4	251	Auto repair shop special machinery.
B-4	256	Aircraft ground servicing equipment.
B-4	400	Generator sets.
B-4	413	Spark plugs.
B-4	430	Storage batteries.
S-1	803	Repair parts.

BUILDING MATERIALS DIV.

B-6	415	Electric conduit and conduit fittings.
B-6	416	Electric connectors.
B-6	417	Fuses, under 2300 volts.
B-6	421	Wiring devices and supplies.
B-7	439	Infrared heating and drying equipment.
B-7	532	Airport lighting equipment.
B-7	534	Floodlights and searchlights.
B-7	535	Lighting fixtures, fluorescent, etc.
B-7	536	Lighting fixtures, incandescent, etc.
B-7	540	Lighting equipment, marine.
B-7	541	Lighting fixtures, blackout.
B-7	542	Lighting fixtures, street highway, etc.
B-7	645	Edge tools.
B-7	646	Hand tools.
B-7	700	Fabricated wire products.
B-7	701	Metal doors and windows.
B-7	702	Building products, steel.
B-7	703	Plastering bases and accessories.
*B-7	704	Screen cloth, metal.
B-7	705	Building products, sheet metal.
B-7	706	Hardware, builders.
B-7	707	Hardware, transportation equipment.
B-7	708	Hardware, saddle, luggage, etc.
B-7	710	Ball and socket joints.
B-5	714	Bolts, nuts, rivets, etc.
B-7	723	Building products, non-metallic mineral.
B-1	805	Repair parts.

CHEMICALS DIV.

S-4	168	Blast detonating equipment.
S-4	204	Meat packing house machinery.
S-4	241	Chemical producing machinery.
S-4	242	Paint and varnish making machinery.
S-4	243	Drug, pharmaceutical, cosmetics machinery.
S-4	244	Plastic molding machinery.
S-4	245	Fertilizer machinery.
S-4	246	Salt processing machinery.
S-4	247	Animal, fish, vegetable oil machinery.
*S-4	665	Cooking utensils, glass.
S-5	761	Plastics, molded and laminated.
S-1	806	Repair parts.
S-5	921	Book matches.
S-5	923	Hemp driers.
S-5	924	Paint drying machinery.
S-5	925	Wax molding machinery.
S-5	931	Glass making machinery.
S-5	932	Parental and blood plasma serum units.

CONSTRUCTION MACHINERY DIV.

Class "A" Civilian Type Products

B-9	308	Construction equipment, tractor mounted.
G-1	309	Construction, equipment specialized.
G-1	310	Construction material mixers, etc.
G-1	311	Construction material processing equipment.
B-8	312	Power, cranes, shovels, etc.
G-1	313	Scrapers, maintainers, and graders.
B-8	314	Winches and hoists.
B-8	316	Drilling and boring machinery.
B-8	318	Drilling machinery, water well.
B-8	470	Track-laying tractors.
S-1	809	Repair parts.

CONSUMERS DURABLE GOODS DIV.

G-2	109	Bicycles.
G-2	110	Power cycles.
*G-2	423	Lamp bulbs and tubes, electric.
G-2	424	Cooking and heating appliances, commercial (electric).

YOUR WAR WORKERS CAN NOW BUY TOOLS

with your priority rating

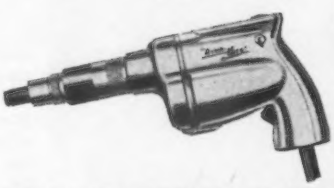
Does a shortage of worker-owned tools hamper your output? WPB's rules offer a quick way out: War workers who buy their own tools for maintenance, operation, and repair can now get them promptly from mill supply and hardware stores *by presenting a simple signed certification of need.* If your company is on Schedule I of MRO Regulations, your workers get the rating AA-1; if you're on Schedule II, AA-2; and unlisted, AA-5. The present plan has these restrictions:

1. Only one tool may be bought on each certification.
2. Certification must be signed by *both* employer and employee.
3. Certification must state that the worker needs the tool for his job, and that he does not have a similar tool which would serve the purpose.

That's just about the whole story . . . but remember this: It takes as much scarce material to make a *poor* tool as it does to make a *good* one. You serve the war effort *best* by selecting *quality* tools. So specify the better brands. One of these is Millers Falls, whose hand tools, portable electric tools, hack saw blades, and precision tools fulfil *every* requirement for efficient work, easy handling, and *long* service life.

PASS ALONG THIS GOOD NEWS TO YOUR WORKERS WHO NEED TOOLS

HAND TOOLS



PORTABLE ELECTRIC TOOLS

HACK SAW BLADES

PRECISION TOOLS

MILLERS FALLS TOOLS SINCE 1868

MILLERS FALLS COMPANY

GREENFIELD, MASSACHUSETTS, U.S.A.

R.S.V.P.

IF YOU HAVE ANY SURFACE GRINDING PROBLEMS—ANSWER THESE QUESTIONS . . DETACH THE COUPON AND SEND IT TO US

THE BLANCHARD MACHINE COMPANY
SURFACE GRINDING MACHINES
64 STATE ST., CAMBRIDGE, MASS., U.S.A.

Are you machining flat surfaces? Yes ☐ No ☐

Is the machining of hard steel a problem? Yes ☐ No ☐

Are you wasting iron on oversize castings so cutting tools can get under the hard skin? Yes ☐ No ☐

Are your labor and machine costs high due to necessity for performing roughing and finishing operations on separate machines? Yes ☐ No ☐

Are you satisfied with your
(a) finish? Yes ☐ No ☐ (b) flatness? Yes ☐ No ☐ (c) parallelism? Yes ☐ No ☐ (d) dimension tolerance? Yes ☐ No ☐

Would you like to produce surfaces to a limit of 5 micro inches? Yes ☐ No ☐

Are your lapping operations long and expensive? Yes ☐ No ☐

Is your production rate on flat surfaces equal to the best that can be found elsewhere? Yes ☐ No ☐

Will you allow our representative to call and discuss Blanchardized surfaces and how Blanchard Vertical Grinders can serve you? Yes ☐ No ☐

Our booklet, Work Done on the Blanchard, is free for the asking. It may point the way to economies in your manufacturing department. Would you like a copy? Yes ☐ No ☐

Further comments .....

Name ..... *Position* .....

Company .....

Address .....

I. A.

BLANCHARD WORK BOOK

The BLANCHARD MACHINE COMPANY
64 STATE STREET, CAMBRIDGE, MASS., U. S. A.

G-2	425	Cooking and heating appliances, domestic (electric).
G-2	426	Electric appliances, commercial (exc. heating and cooking).
G-2	427	Electric appliances, domestic (exc. heating and cooking).
*G-2	429	Dry cell batteries.
G-2	432	Tubes, rectifier.
G-2	476	Laundry machinery, domestic.
G-2	484	Lawn mowers, hand and power.
*G-2	530	Refrigerators, ice; domestic.
*G-2	533	Flashlight cases, etc.
*G-2	537	Lamps and lanterns, liquid fuel.
*G-2	538	Lamps, portable electric.
G-2	539	Lanterns, electric, incandescent.
*G-2	543	Bedsprings and innerspring mattresses.
G-2	544	Bunks and berths, metal.
*G-2	545	Furniture, wooden.
*G-2	546	Hospital beds, metal.
G-2	548	Photographic equipment and accessories.
G-2	583	Food preparation and serving fixtures.
*G-2	648	Cutlery.
*G-2	649	Razors (exc. electric).
*G-2	650	Razor blades.
G-2	651	Jewelry.
*G-2	652	Silverware, plated.
G-2	653	Silverware, sterling.
*G-2	654	Clocks, watches and chronometers.
*G-2	656	Animal traps and cages.
G-2	657	Bells and gongs, non-electric.
*G-2	659	Kitchen, household, and similar articles.
G-2	660	Identification plates, badges, etc.
*G-2	661	Hairpins, bobby pins, and hair curlers.
G-2	663	Needles, domestic.
*G-2	664	Pins, common and safety.
G-2	666	Mirrors.
*G-2	670	Morticians' goods.
*G-2	671	Musical instruments.
*G-2	672	Office supplies.
*G-2	673	Pens and pencils.
*G-2	674	Umbrellas and parasols.
*G-2	675	Baby carriages and similar equipment.
G-2	676	Fishing equipment, commercial.
G-2	677	Sporting goods.
*G-2	678	Church goods.
S-1	807	Repair parts.
S-5	915	Miscellaneous consumers durable goods.

CONTAINERS DIV.

Class "A" Civilian Type Products

G-4	526	Drums, barrels, shipping kits, and pails.

Class "B" Products

G-5	620	Containers, paper (consumer type)
G-5	621	Shipping containers, corrugated and solid fiberboard.
G-5	622	Drums, fiber.
G-5	623	Beverage crowns, metal.
G-5	624	Crowns, metal (exc. beverage).
*G-5	625	Collapsible tubes.
G-5	627	Fluid milk shipping containers and covers.
G-3	628	Gas cylinders.
A-1	629	Cans, metal.
G-4	630	Plugs and flanges.
G-5	632	Bag ties, metal.
G-5	633	Baskets and hampers, veneer.
G-5	634	Boxes and crates, wooden nailed.
G-5	635	Boxes and drums, plywood.
G-5	636	Boxes, wooden, wirebound.
G-5	637	Cooperage, slack.
G-5	638	Cooperage, tight.
A-1	639	Metal closures (domestic).
A-1	640	Metal closures (commercial).
G-5	716	Strapping, metal (round and flat), including seals.
S-1	810	Repair parts.
S-5	930	Ties, wire.

COPPER DIV.

S-1	811	Repair parts.
S-5	914	Armored cable.
S-5	991	Copper alloying, coating, etc.

CORK, ASBESTOS & FIBROUS GLASS DIV.

S-4	721	Asbestos building material accessories.
S-4	722	Asbestos metallic yarn, etc.
S-4	724	Fibrous glass products.
S-4	728	Packings, gaskets, and oil seals.

FARM MACHINERY DIV.

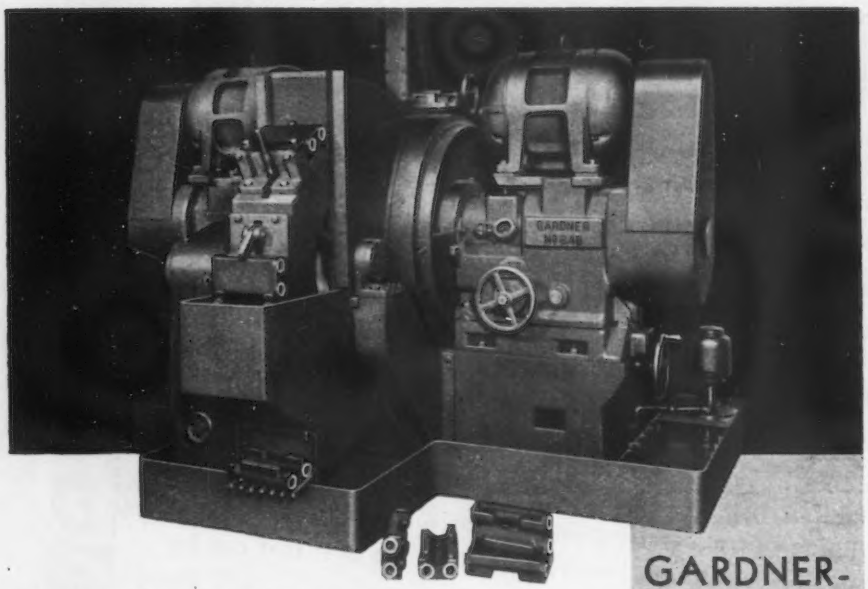
Class "A" Civilian Type Products

A-2	450	Earthworking, fertilizing, spraying, etc., machinery.
A-2	451	Farm elevators, harvesting, haying machinery.
A-2	452	Farm wagons, trucks, irrigating equipment, etc.
A-2	453	Barnyard, dairy, poultry, equipment, etc.
A-2	471	Tractors, wheel-type.
S-1	813	Repair parts.

GENERAL INDUSTRIAL EQUIPMENT DIV.

Class "A" Civilian Type Products

J-5	147	Industrial trucks and tractors, hand-operated.
J-5	148	Industrial trucks and tractors, power-opefated.



TANK TREADS
at *6 per minute!*

TYPICAL of the war jobs being handled today on Gardner Grinders, is this cast steel tank tread. The parallel ends of these tough steel castings are ground on a No. 84B-40" Double Head machine, using a 6-station rotary carrier as shown. They are clamped by hand, but are released automatically, and unload at the front.

Stock removal averages 1/8" over all; that's why it takes this husky machine, carrying 2 — 40 H.P. motors, to lick the job. Production is AT THE RATE OF 4 TO 6 PER MINUTE, and the treads are held within .010" for flatness and .002" for parallelism and uniformity.

A TOUGH job—YES! But not too tough for a Gardner Grinder carrying modern heavy-duty Gardner WIRE-LOKT Abrasives!

Write for data on GARDNER DOUBLE-GRINDING!

GARDNER-GRIND for *War Production!*

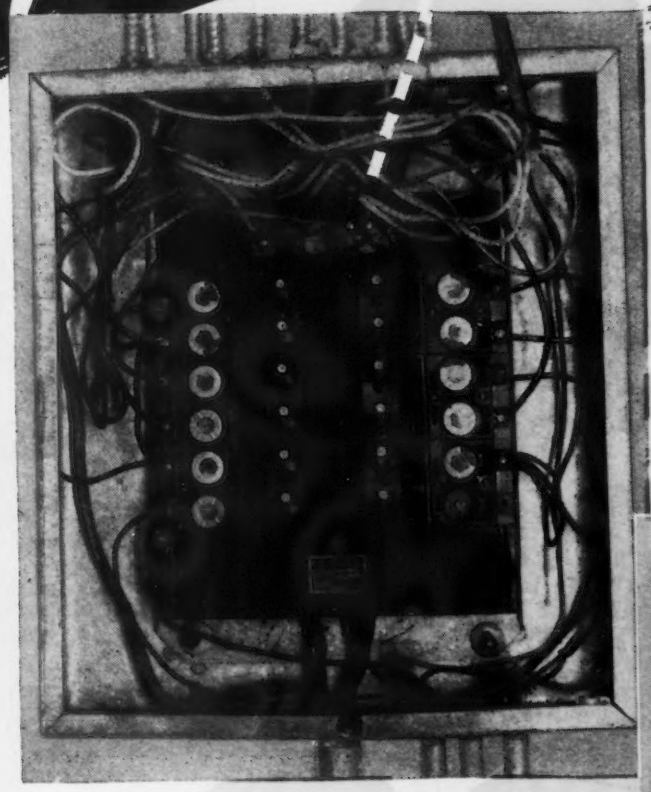
WIRE-LOKT ABRASIVES *mean efficient* DISC GRINDERS

GARDNER · GRIND YOUR *Flat* SURFACES

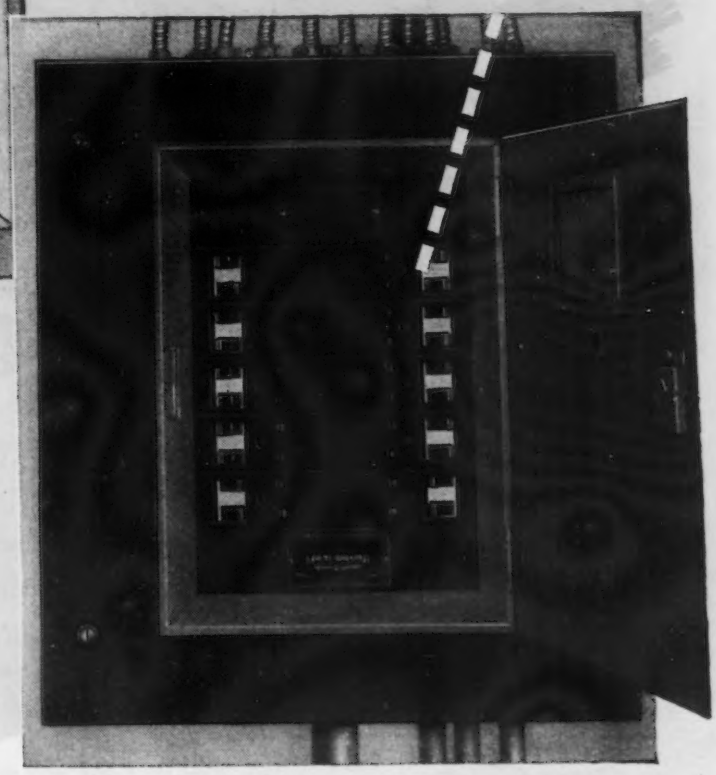
GARDNER MACHINE COMPANY

412 East Gardner Street · · · · Beloit, Wisconsin, U.S.A.

Problem AND Solution



Problem: An obsolete and overloaded fusible type panel. It provided only 12 lighting and power circuits. More were needed.



Solution: A new Square D Multi-breaker panelboard, installed in the old box, using the same conduit. Provides 20 circuits . . . 66⅔% more capacity.

Multi-breaker lighting and distribution panels, when installed in existing panel boxes, usually increase the number of circuits by more than 50%. They eliminate fuses completely . . . provide modern convenience and protection. Your nearest Square D Field Engineer will help you determine your equipment and priority requirements.

ELECTRICAL EQUIPMENT • KOLLSMAN AIRCRAFT INSTRUMENTS

SQUARE D COMPANY

DETROIT • MILWAUKEE • LOS ANGELES

Class "B" Products

G-7	138	Compressors and dry vacuum pumps.
G-7	141	Industrial pumps.
J-5	145	Conveyors and conveying systems.
J-5	149	Fans, blowers, and exhausters.
J-5	150	Dust collecting equipment.
J-5	151	Turbo blowers and exhausters.
G-8	153	Mechanical power transmission equipment.
G-8	154	Speed changers.
J-5	157	Elevators.
G-9	162	Heat exchangers.
J-5	163	Spraying equipment, industrial.
J-5	166	Baling presses.
J-5	167	Lubricating equipment, industrial.
J-5	169	Glue pots.
J-5	200	Bakery machinery.
J-5	201	Canning plant machinery.
J-5	202	Cereal manufacturing machinery.
J-5	203	Dairy machinery.
J-5	204	Meat packing house machinery.
J-5	205	Sugar mill and refinery machinery.
J-5	209	Fiber drum making machinery.
J-5	211	Paper can and tube making machinery.
J-5	233	Dry kilns and redriers.
J-5	234	Logging and sawmill machinery.
J-5	235	Wood box making machinery.
J-5	236	Woodworking machinery.
J-5	237	Tobacco manufacturing machinery.
J-5	239	Ceramic manufacturing machinery.
J-5	252	Can making and closing machinery.
J-5	360	Wire working machinery.
J-1	366	Welding equipment and apparatus, electric.
J-1	367	Welding equipment and apparatus, non-electric.
J-2	368	Welding rods and electrodes.
G-6	401	Motors and generators, electric.
J-3	406	Electric motor controls and equipment.
J-3	408	Air circuit breakers.
J-3	409	Busways and bus ducts
J-3	410	Panel and distribution boards.
J-3	411	Switches, knife and enclosed.
J-5	436	Anodizing equipment.
J-5	437	Electroplating equipment.
J-5	440	Magnets.
J-5	478	Bottling machines.
J-5	479	Case packers.
J-5	481	Packaging machinery.
J-4	531	Refrigeration and air conditioning equipment.
J-5	655	Pressure vessels.
J-5	713	Metallic tubing and hose, flexible.
J-5	718	Carbon brushes.
J-5	719	Carbon products, industrial.
S-5	758	Beverage machinery.
S-1	815	Repair parts.
S-5	913	Miscellaneous products.

GOVERNMENT DIV.

S-4	170	Sewer cleaning machinery.
S-4	680	Governmental items, specified.
S-4	681	Sewage treatment machinery.
S-5	920	Miscellaneous products.
S-5	926	Coins.

LUMBER AND LUMBER PRODUCTS DIV.

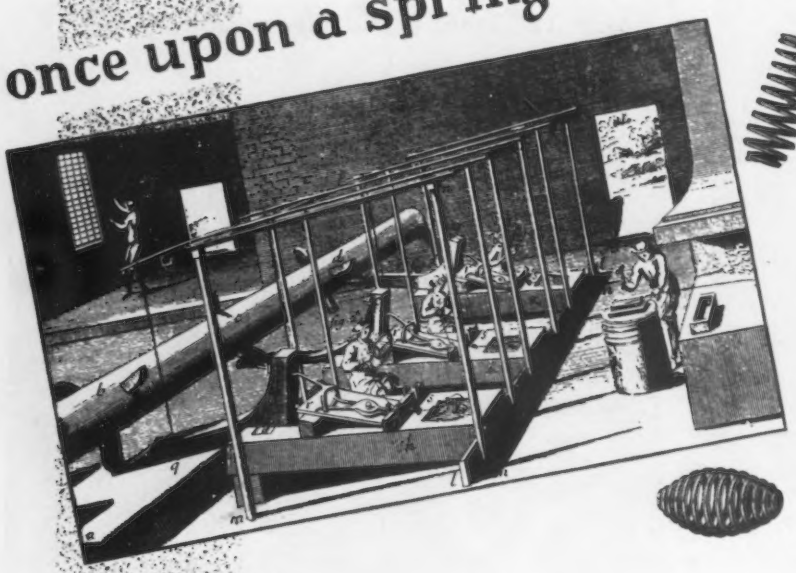
Class "A" Civilian Type Products

S-4	742	Mobile housing.
S-4	743	Prefabricated buildings, wooden.

Class "B" Products

S-4	740	Fabricated wooden products.
S-4	741	Millwork.

once upon a spring-*time*...



Here is illustrated a wire mill that was ultra-modern a few centuries ago. Who can say how long its day's production would have served a 1943 Torrington Spring Coiler?

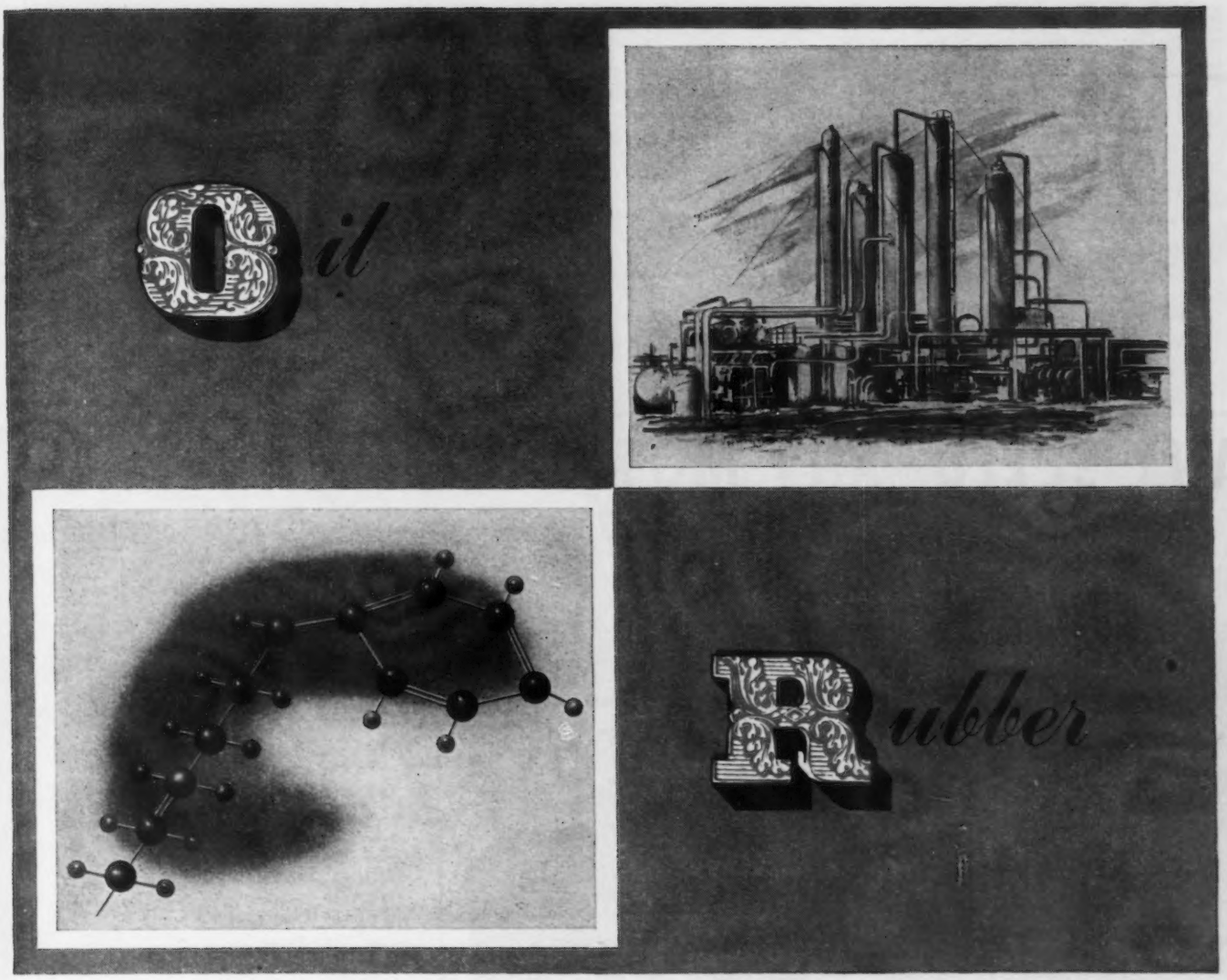
Probably a matter of minutes, as Torrington Spring Coilers can use up to 450 feet of wire per minute.

Modern wire mills have not only made possible our Coilers, but have created the industry of professional springmaking. This industry has purchased more Torrington Spring Coilers each year since 1937 than those of all other spring coiler manufacturers combined.

No. 4 of a Series.

THE TORRINGTON
MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

FIRST: This armor-piercing projectile, made by Bethlehem Steel Co., Bethlehem, Pa., was the first of its type to hit a German tank in North Africa, according to War Department records. It was one of a sample lot of M-61 75 mm. shells tested during the spring of 1942 by firing at a captured German tank in the North African war zone.



The synthetic rubber and refinery industries are using large quantities of Arcos Stainless Steel and alloy electrodes for construction and maintenance purposes. We are keeping a steady flow of many peacetime grades going to these industries, while at the same time, we are shipping increasing quantities of stainless armor welding electrodes for Army and Navy use. Be sure, specify Arcos... leaders in research and production of stainless and alloy welding electrodes.

ARCOS CORPORATION
401 NORTH BROAD ST., PHILADELPHIA, PA.

Distributors Warehouse Stocks in the Following Cities:

Borger, Texas.....Hart Industrial Supply Co.
Boston, Mass. (Belmont), H. Boker & Co., Inc., W. E. Fluke
Buffalo, N.Y.....Root, Neal & Co.
Chicago, Ill.....Machinery & Welder Corp.
Cincinnati, Ohio.....Williams & Co., Inc.
Cleveland, Ohio.....Williams & Co., Inc.
Columbus, Ohio.....Williams & Co., Inc.
Detroit, Michigan....C. E. Phillips & Co., Inc.
Erie, Penna.....Boyd Welding Co.
Fresno, Calif.....Victor Equipment Co.
Ft. Wayne, Ind..Wayne Welding Sup. Co., Inc.
Honolulu, Hawaii.Hawaiian Gas Products, Ltd.
Houston, Texas..Champion Rivet Co. of Texas
Kansas City, Mo..Welders Supply & Repair Co.
Kingsport, Tenn.....Slip-Not Belting Corp.
Los Angeles, Calif.....Victor Equipment Co.
Milwaukee, Wis....Machinery & Welder Corp.
Moline, Ill.....Machinery & Welder Corp.
New Orleans, La.....Wm. D. Seymour Co.
New York, N. Y.....H. Boker & Co., Inc.
Oklahoma City, Okla..Hart Industrial Supply Co.
Pampa, Texas.....Hart Industrial Supply Co.
Pittsburgh, Pa.....Williams & Co., Inc.
Rochester, N. Y.....Welding Supply Co.
San Diego, Calif.....Victor Equipment Co.
San Francisco, Calif....Victor Equipment Co.
Seattle, Wash.....Victor Equipment Co.
St. Louis, Mo.....Machinery & Welder Corp.
Syracuse, N. Y.....Welding Supply Co.
Wichita, Kansas.....Watkins, Inc.

ARMY E NAVY

it's ARCOS for stainless electrodes

"QUALITY WELD METAL EASILY DEPOSITED"

S-4 744 Timber connectors.
S-1 816 Repair parts.
S-4 906 Miscellaneous products.

MINING DIV.

J-7 144 Crushing and grinding machinery.
J-7 300 Cars and locomotives, underground mine haulage.
J-7 301 Coal cutting machines.
J-7 302 Conveyors, portable underground mine type.
J-7 303 Hoists, mine and smelter types.
J-7 304 Mine loaders, underground.
J-7 305 Ore dressing and coal preparation equipment.
J-7 306 Smelting and refining equipment.
J-7 307 Mining equipment, specialized.
J-7 315 Mining drills.
J-7 770 Cars, industrial.
S-1 818 Repair parts.

MISCELLANEOUS MINERALS DIV.

S-4 351 Diamond dies.
S-4 727 Jewel bearings.
S-1 819 Manufacturers' repair parts.

PLUMBING AND HEATING DIV.

J-8 474 Dishwashing and glasswashing machinery.
J-8 570 Sanitary ware, plumbing.
J-8 571 Plumbing fixtures, fittings, and trim.
*J-8 576 Boilers, cast-iron.
J-8 577 Boilers, low-pressure, steel.
J-8 578 Coils, blast heating.
J-8 579 Convectors, heating.
*J-8 580 Radiators, cast-iron.
*J-8 581 Cooking stoves and ranges, domestic (exc. electric).
J-8 582 Cooking equipment, commercial (exc. electric).
*J-8 584 Heating stoves, domestic (exc. electric).
J-8 585 Unit heaters and unit ventilators.
*J-8 586 Warm air distribution equipment.
*J-8 587 Warm air furnaces.
J-8 588 Burners, gas industrial.
J-8 589 Burners, oil, industrial.
J-8 590 Burners, combination oil and gas (industrial).
J-8 591 Gas conversion burners, domestic.
J-8 592 Oil burners, domestic.
J-8 593 Stokers, domestic.
J-8 594 Heating system controls.
*J-8 595 Hot water equipment, domestic (exc. electric).
J-8 596 Fabricated pipe.
J-8 762 Liquefied petroleum gas and air mixers.
S-1 821 Manufacturers' repair parts.

RADIO AND RADAR DIV.

J-9 255 Vacuum tube manufacturing machinery.
J-9 500 Capacitors and condensers.
J-9 501 Coaxial cable.
J-9 503 Crystal assemblies.
J-9 504 Filters.
J-9 505 Microphones and speakers.
J-9 506 Resistors.
J-9 507 Sockets.
J-9 508 Vibrators.
J-9 509 Test sets.
J-9 511 Tubes.
J-9 512 Intercommunication equipment.
J-9 600 Control valves and regulators.
J-9 601 Electric measuring instruments.
J-9 602 Instruments, industrial type.
J-9 729 Radio hardware.
S-1 825 Repair parts.
S-5 910 Radio transmitters and receivers.
S-5 912 Radio apparatus, specialized.

SAFETY AND TECHNICAL EQUIPMENT DIV.

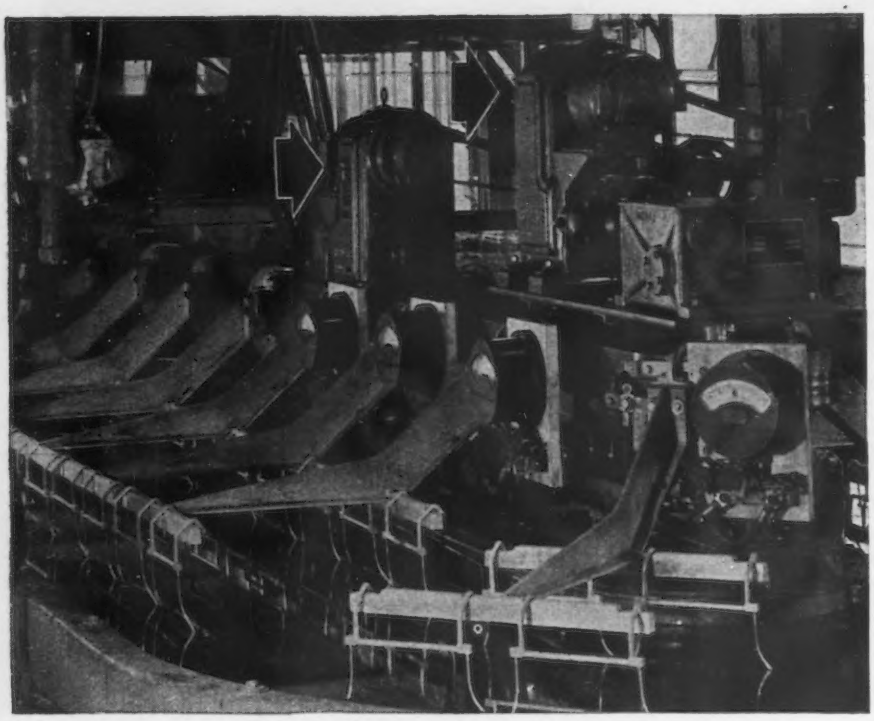
Class "A" Civilian Type Products

J-6 107 Fire apparatus.

Class "B" Products

J-6 250 Optical and ophthalmic goods making machinery.
J-6 253 Medical goods making machinery.
J-6 254 Fire fighting equipment manufacturing machinery.
*J-6 433 Physiotherapy apparatus.
*J-6 434 X-ray apparatus.
J-6 549 Safety equipment, industrial.
J-6 551 Sprinkler systems.
J-6 552 Fire extinguisher systems, piped.
J-6 553 Fire extinguishers, portable.
J-6 554 Fire hose, etc.
J-6 555 Alarm and signal systems.
J-6 556 CO_2 fire extinguishers.
J-6 604 Engineering instruments and equipment.
J-6 606 Laboratory instruments and equipment.
*J-6 613 Surgical and medical instruments and equipment.
*J-6 614 Dental instruments and equipment.
J-6 615 Oxygen equipment, airborne.

ANY SPEED—ANY MOTION—
For Any Plating Job



REEVES VARIABLE SPEED CONTROL WIDENS RANGE OF PLATING CONVEYOR

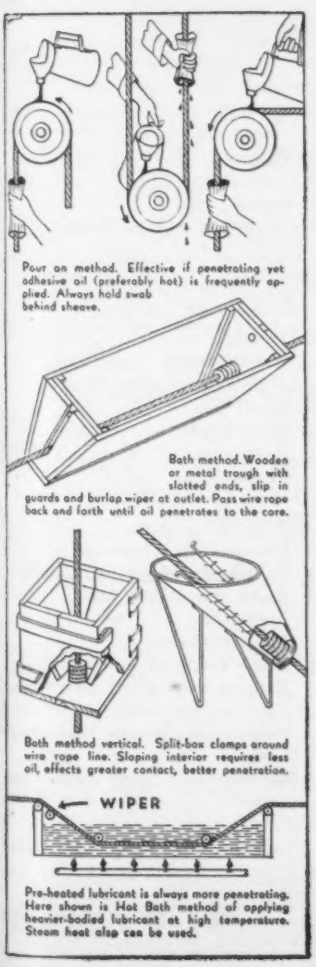
War production has made many new demands on the metal plating industry. New metals to be plated—new sizes and shapes of castings—new thicknesses of deposit. And, of course, vastly increased production in record smashing time. To meet these requirements, a wide range of speeds, instantly available, is essential; also provision for controlling different motions of work, and for synchronizing different processes. The Hanson-VanWinkle-Munning plating conveyor shown above is standardly equipped with REEVES Motodrives which provide any needed speed for four distinct motions of work, and also makes possible the combination of two or more types of plating with a single unit of cleaning, rinsing, drying and auxiliary conveying equipment . . . Booklet I-423, "More Output for Victory," gives many other interesting examples of how REEVES variable speed drives are helping speed up war production. Send for it.

REEVES PULLEY COMPANY, COLUMBUS, INDIANA

REEVES SPEED CONTROL

WIRE ROPE HAS MANY WORKING PARTS

WHICH MUST BE LUBRICATED!


Pour on method. Effective if penetrating yet adhesive oil (preferably hot) is frequently applied. Always hold swab behind sheave.
Bath method. Wooden or metal trough with slotted ends, slip in guards and burlap wiper at outlet. Pass wire rope back and forth until oil penetrates to the core.
Both method vertical. Split-box clamps around wire rope line. Sloping interior requires less oil, effects greater contact, better penetration.
WIPER
Pre-heated lubricant is always more penetrating. Here shown is Hot Bath method of applying heavier-bodied lubricant at high temperature. Steam heat also can be used.

Nothing can withstand friction forever. Not even the diamonds our toolmakers use in making precision dies for drawing wire. Friction is set up wherever one thing moves while in contact with another. In wire rope, wires move in contact with wires, strands in contact with strands and the core in contact with both. Were this not true wire rope would have no flexibility.

To a high degree the design of Union Wire rope minimizes the harshness of friction. It lays the component parts in such precise repose that they work together with the greatest smoothness. Never-the-less steel works upon steel with increasing pressure as the rope tautens under load and flexes around sheaves.

Only lubrication will protect against the wear of friction. The cores of Union Wire Rope are specially treated to provide some initial internal lubrication. However, they cannot be sufficiently saturated to provide an indefinite supply of lubricant and should not be considered an oil reservoir. If core lubricant is allowed to become exhausted, the core and subsequently the rope deteriorates rapidly.

Tests show that properly lubricated wire rope withstands from 2½ to 5 times as many bends over sheaves as dry rope.

Illustrated at the left are a few of the methods employed in lubricating wire rope. Application of hot lubricant is more effective. Whether applied hot or cold the lubricant should have the ability to penetrate to the core, to adhere, resist wiping off, to coat both wires and core, to keep out moisture, to preserve as well as lubricate and must be neutral, i.e. free of corroding chemicals. Since each rope use presents its own lubricating problem, more detailed information will be supplied if you will send an outline of your operating conditions.

UNION WIRE ROPE CORPORATION
2158 Manchester Ave., KANSAS CITY, MO.
Tulsa Houston Chicago Salt Lake City New Orleans
Monahans, Texas Portland Ashland, Ky. Atlanta

union *Wire Rope*

USERS OF HIGH CARBON STEEL WIRE . . . NOTE! Subject to war conditions only, our facilities are such as to afford you a dependable source of supply for high carbon steel wire. Our engineers are prepared to submit interesting proposals on your specifications and requirements.

AE-43

"THE ULTIMATE LOW COST WIRE ROPE"

WHEN YOU NEED PREFORMED WIRE ROPE SPECIFY **union-formed**

*J-6	667	Dental supplies.
*J-6	668	Ophthalmic goods.
*J-6	669	Surgical and medical supplies.
S-1	827	Repair parts.
J-6	845	Research laboratories: services.

SERVICE EQUIPMENT DIV.

S-4	428	Vacuum cleaners, industrial.
S-4	472	Office machinery.
S-4	473	Scales and balances.
S-4	475	Laundry, cleaning, and pressing machinery.
S-4	483	Floor finishing and maintenance machines.
S-4	547	Motion picture projection equipment, 35 mm.
S-1	828	Repair parts.
S-1	836	Miscellaneous machine shop products for MRO.
S-1	840	Electric and elevator repair shops: services.
S-1	841	Mechanical repair shops: services.
S-4	842	Electroplaters, etc.: services.
S-4	846	Waterwell drillers: services.

SHIPBUILDING DIV.

B-2	560	Diesel engines, marine.
K-3	572	Pipe fittings, steel.
K-3	573	Pipe fittings, not steel.
K-1	574	Valves, steel.
K-2	575	Valves, not steel.
K-3	597	Piping accessories.
S-1	829	Repair parts.
S-5	918	Miscellaneous products.

STEEL DIV.

S-4	717	Iron castings.
S-4	736	Cotton bale ties.
S-4	737	Refractory brick, metal clad.
S-1	830	Repair parts.
S-5	927	Forgings.
S-4	206	Cotton ginning and delinting machinery.
S-4	207	Sewing machines, industrial.
S-4	208	Textile machinery.
S-4	240	Leather working machinery.
S-4	249	Broom, brush, and mop making machinery.
S-4	598	Bag stitching machines.
S-4	662	Hooks and eyes, etc.
S-4	679	Brushes: Fiber, steel, wire.
S-4	715	Nails and tacks.
S-1	831	Repair parts.
S-5	907	Baskets and hampers, canvas.
S-5	908	Miscellaneous products.

TOOLS DIV.

K-7	146	Cranes and hoists.
K-4	155	Bearings, ball and roller.
K-5	350	Machine tools.
K-7	352	Die casting and moulding machines.
K-7	353	Extruding machines.
K-7	354	Forging machines.
K-7	355	Presses, hydraulic and mechanical.
K-7	356	Bending machines.
K-7	357	Rolling mill stands.
K-7	358	Shears, punches and nibblers.
K-5	361	Machine tool attachments and accessories.
K-6	362	Tools, metal cutting.
K-7	363	Foundry machinery, etc.
K-7	364	Heat treating equipment.
K-7	365	Metal-working machines and tools, portable.
K-7	422	Furnaces, electric.
K-7	644	Files and rasps.
K-7	647	Tools, mechanics'
K-7	658	Gages and machinists' precision measuring tools.
K-7	712	Chains.
K-7	720	Abrasive products.
S-1	833	Repair parts.
K-7	917	Quartz cutting machines.

TRANSPORTATION EQUIPMENT DIV.

Class "A" Civilian Type Products

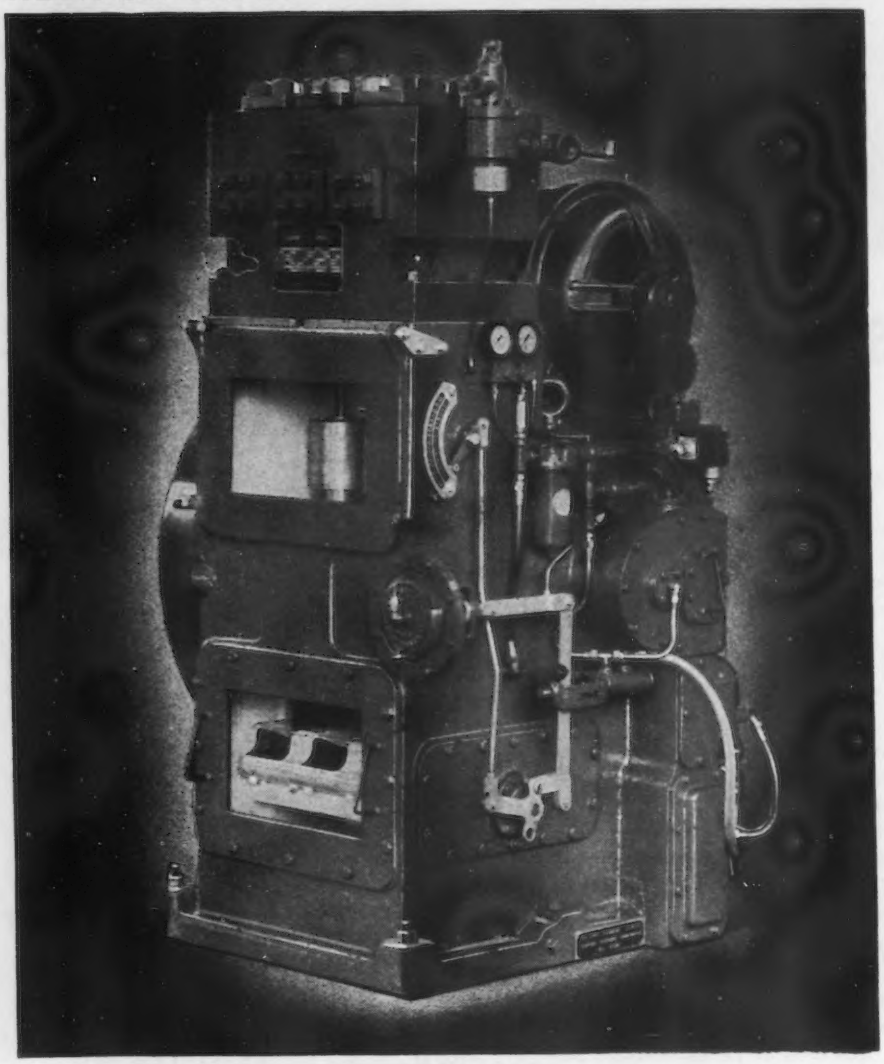
K-9	750	Locomotives.
K-9	751	Railroad cars.
K-9	752	Railroad type industrial cars.
K-9	753	Street cars.
K-9	754	Motor buses.
K-9	755	Bus bodies.
K-9	756	Trolley buses.

Class "B" Products

K-8	100	Railroad car accessories.
K-8	101	Railroad locomotive accessories.
K-8	102	Rapid transit and street car accessories.
K-8	103	Bus accessories.
K-8	104	Brake actuating mechanisms.
K-8	164	Railroad and transit maintenance of way equipment.
K-8	165	Railroad and transit track equipment.
K-8	514	Railroad and transit signal equipment.
S-1	834	Repair parts.
S-1	843	Railroad equipment repair shops.
K-8	909	Miscellaneous products.

*Programs for which Office of Civilian Requirements handles allotments.

ALDRICH-GROFF CONTROLLABLE CAPACITY "POWR-SAVR" PUMP



...FOR HYDRAULIC SERVICE

New standards of control simplicity, flexibility and operating economy are being set by these unique, constant-speed, variable-stroke vertical triplex pumps, which are designed to operate at discharge pressures as high as 15,000 p.s.i. Write today for Data Sheet 65 which gives full details of design, construction, operation and application.

THE ALDRICH PUMP CO. ★ 8 PINE STREET ALLENTOWN, PENNA.

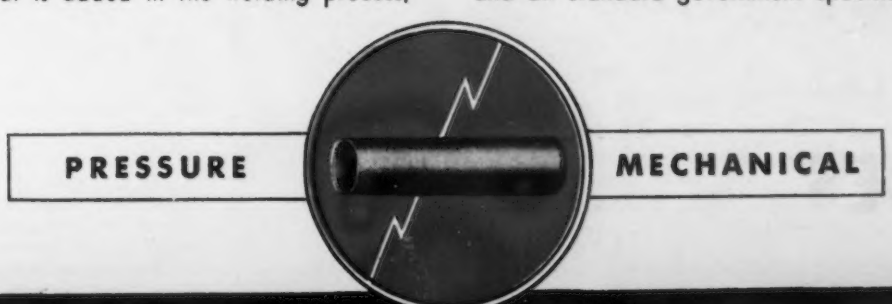
BETTER ELECTRIC WELDED STEEL TUBING

For Today and Tomorrow

PRODUCED ON AMERICA'S MOST MODERN TUBE MILLS

For your wartime applications requiring greater strength and lighter weight, Talon's Electric Welded Steel Tubing is being produced in ever increasing quantities. Sizes now available for reasonably prompt delivery range from ¾" to 4" O. D. in lengths up to 40 feet. It is cold-formed from strip steel on the most modern, precision controlled equipment in existence. Since the accurate gauge and width of the flat-rolled strip are controlled by very close tolerances, the O. D. and I. D. of the finished tube are concentric.

As no extra metal is added in the welding process, the grain structure of wall and weld is homogeneous. Physical properties are further improved by atmospheric annealing; this also produces a scale-free, bright finish which hides no defects on either inside or outside surface. Maximum strength of Talon's Electric Welded Steel Tubing is assured by hydrostatically testing every foot of pressure tubing for safety and by carefully inspecting mechanical tubing to meet your own individual requirements. Hence, Talon's Electric Welded Tubing meets A. S. M. E., S. A. E., A. S. T. M., A. B. S. and all standard government specifications.



TALON . . INC.

STEEL TUBE DIVISION **OIL CITY, PENNA.**

Briefly Told—

Admiral Vickery Says Good Welding Increases Ship Quality and Speed

• Declaring that modern advancements in welding have made possible our present enormous output of ships, Rear Admiral Howard L. Vickery, vice-chairman of the Maritime Commission, last week asserted that in every shipyard capable welding supervisors and operators can increase the quality of a ship and the speed with which it is built. In a brief introduction to a new instruction booklet directed to all contractors constructing ships for the Maritime Commission, Admiral Vickery pointed out that inexperienced and poorly skilled welding supervisors and operators can and do upset production schedules.

•

• Secretary of the Interior Harold L. Ickes revealed Sept. 6 that the most extensive exploratory program ever undertaken in the United States and Alaska for war minerals had been launched by the Bureau of Mines under a $3,900,000 Congressional appropriation item. It is under way in 30 states and Alaska.

•

• Substantially increased production of "Caterpillar" diesel tractors for military purposes will be achieved in the near future, says Louis B. Neumiller, president of Caterpillar Tractor Co. Some of the work will be done in the Victory Ordnance Plant at Decatur, Ill., operated by the "Caterpillar" subsidiary, Caterpillar Military Engine Co., and much of the manufacturing and the final assembly will be handled in the Berwick, Pa., plant of the American Car & Foundry Co.

•

• Labor leaders should be made accountable for handling union funds said Paul Coddington, president of the Lakeside Bridge & Steel Co., Milwaukee, to members of the Waukesha, Wis., Rotary club in a recent talk on postwar industrial relations.

•

• Engines for the super bombers predicted on Aug. 31 by Gen. H. H. Arnold, commanding general of the U. S. Army Air Forces, are now being built in a plant of Wright Aeronautical Corp., according to an announcement by the U. S. Army Air Forces in Paterson, N. J.

•

• The last of the 16 ore carriers being built by the Maritime Commission was scheduled to be launched Sept. 11 at the Ashtabula (Ohio) Yard of Great Lakes Engineering Co. Eleven ships are in commission with three expected to make maiden trips this month. It is expected that all 16 will see some ore service this year. The ships are being sold by the Maritime Commission to existing ore steamship companies.

•

• Acting upon an executive order of the President, Admiral Emory S. Land, War Shipping Administrator, announced Sept. 4 that he had immediately taken possession and assumed operation of the Atlantic Basin Iron Works, Inc., a ship repair yard at Brooklyn, N. Y.

•

• Open-mesh steel grating is being used in place of special plate steel trays in the heat treatment of metal bottles vital to the war effort. The idea of using 84 per cent open steel grid in place of the solid type tray for annealing was inspired by the Walter Kidde Co., Belleville, N. J., for improving annealing uniformity. Engineers of the Irving Subway Grating Co. were consulted and the design for a new type of tray was developed.

•

• The Quarterly of the Colorado School of Mines containing The Occurrence and Production of Vanadium has been published. Copies can be obtained from the Department of Publications, Colorado School of Mines, Golden, Colo., at $1.00 postpaid.

•

• "Studies in Arc Welding" is the title of the 1295-page book, just published by the James F. Lincoln Arc Welding Foundation.

Uniformity

Over- and under-firing, as used by Dempsey in Car Type Furnaces, eliminates the "cold center" so inherent in the plain direct-fired furnace. In addition, it supplies faster heat, saves time and produces excellent uniformity. Illustrating the range of operations for which they are suitable is a single unit now being used for production at temperatures as low as 500°F., at 1200°F. and also giving good uniformity at 1800°F. (name on request). Write for bulletin showing range of standard sizes.

DEMPSEY FURNACES

DEMPSEY INDUSTRIAL FURNACES

The Dempsey staff of heating engineers is at your service at any time. Without obligation, they will be glad to consult with you and make recommendations based upon your own heat treating problems.

DEMPSEY INDUSTRIAL FURNACE CORPORATION

Combined 50 years' experience building Dempsey and Gilbert & Barker Furnaces for all heat treating needs

SPRINGFIELD • MASSACHUSETTS

Here's another 10 seconds the Axis won't get!

You don't stop or slow down the machine to change tools with Apex Quick Change Drill Chucks. And a few seconds saved repeatedly, give you extra *productive* man hours per week per machine.

Green hands catch on quick to these simple, rugged chucks. A flip of the wrist changes drills, taps, reamers, counterbores, etc.—on drill presses, radials, lathes, hand screws, electric and air tools. Plunger design prevents dirt from clogging hole. Ball nose plungers guaranteed not to fall out during life of chuck. Morse taper shanks are standard; others to your specifications. Write for the complete catalog of Apex production tools, No. 14.

APEX

THE APEX MACHINE & TOOL CO., DAYTON, OHIO

Manufacturers of Safety Friction Tapping Chucks, Quick Change and Positive Drive Drill Chucks, Vertical Float Tapping Chucks, Parallel Floating Tool Holders, Power Bits for Phillips, Slotted Head and Clutch Head Screws, Hand Drivers for Phillips and Clutch Head Screws, Aircraft Universal Joints, Plain and Universal Joint Socket Wrenches.

...there's an easier way to end your motor problems

ask Westinghouse!

Maybe the *one best motor for your* job has to be designed . . . maybe modification or selection of an existing type will do the trick. Either way, there's no substitute for "know-how" in designing, modifying or selecting it. Westinghouse puts 57 years of motor and control experience at your disposal to get the right answer sooner. For engineering aid, phone or write your nearest Westinghouse office.

J-21288

P. O. Box 5728, Cleveland, in which 98 outstanding papers submitted in the 1940-42 Industrial Award Program of the foundation have been assembled. The book has nine sections with 98 chapters.

•

• *Free visiting nurse services, to reduce absenteeism by assuring workers of quicker recovery from illnesses, are in operation for Republic Aviation Corp.*

•

• **"The Electron—Key to the Future" is the title of a comprehensive article on electronics appearing in Vol. 3, No. 1 of "Backgrounds," the handsomely illustrated house organ of Pratt & Whitney Division of Niles-Bement-Pond Co., West Hartford, Conn. The booklet is being distributed to a hand picked list.**

•

• A contract, at approximately $400,000, has been awarded Thomas Machine Mfg. Co., Pittsburgh, for an unspecified number of heavy duty billet shears for Russia. The shears, designed by Thomas and equipped with power feed tables, will bite off cold steel billets up to 6 in. square. Work on the contract has already begun.

Canadian Exports, And Imports Hit Peak

Ottawa

• • • **Canada has passed** all previous records in her external trade according to report by Trade Minister MacKinnon. The value of Canadian exports for July attained the record total of $303,600,000 compared with the previous high made in December, 1942, of $269,000,000. Mr. MacKinnon stated that the July figure was approximately four times that of any peace-time monthly trade and about 50 per cent greater than in July, 1942. He said about 75 per cent of the July total was war materials.

Must Efficiency Be Cut? Asks Advisory Board of Lincoln Co.

Cleveland

• • • **How much must we reduce** our efficiency and raise costs to keep from being penalized in renegotiation? This was one question asked by the advisory board of Lincoln Electric Co. by J. F. Lincoln, chairman, in a telegram Monday, Sept. 6 to the Navy Price Adjustment Board in New York.

The telegram said the company was producing at more than four times the rate per manhour of any of its competitors. Other questions included: Have you squared your policy with WPB and the treasury? —pointing out that WPB asks for more efficiency and the treasury for more taxes.

OFFICIAL U. S. NAVY PHOTOGRAPH

Back Home He Drove a Tractor

AMERICAN boys now bring their skill to new tasks, and under the scientific, thorough training of the Army, Navy and Air command are handling machines and instruments wherever our forces are fighting.

Fortunately the vast resources of America permit us to furnish them with the best of everything — arms, munitions, and equipment.

Every Department of the Fenn plant is engaged in war production work — just like thousands of other industrial plants, and that is the job ahead. Sometime in the future the skill of our tool makers, machinists and engineers will be turned again to building special machines and other shop work for which FENN is well-known.

FENN

THE FENN MFG. CO.

HARTFORD, CONN.

ESTABLISHED 1900

FOR TODAY AND TOMORROW

As in War Production Now . . . in the Post War Era ahead AJAX High Speed Forging Presses will be in the forefront in the field of fast, accurate forging production.

While industry is exerting every effort toward the winning of the war, that great day is getting nearer when Post War plans will be put into operation, broader markets will be sought and production advantages will take on a slightly different but extremely important meaning.

On that tomorrow, as today, manufacturers who depend on Ajax Forging Presses for a high output of quality forgings at a consistently low production cost will be in an enviable position.

Write for Bulletin No. 75

THE AJAX MANUFACTURING COMPANY

EUCLID BRANCH P. O. CLEVELAND, OHIO

621 MARQUETTE BUILDING • CHICAGO, ILLINOIS

GERMAN SCIENTIFIC WORKS

Now Available in American Editions

In addition to Beilstein's *Handbuch der organischen Chemie*, we are reprinting 55 German scientific and technical titles, under authority of the U. S. Alien Property Custodian. These are duplicates of the original imported editions; but are offered (in most cases) at prices considerably below those of the imported copies which, due to wartime restrictions, are no longer obtainable. Included in the 55 titles are the following:

NEUMANN, BERNHARD, ed.: *Lehrbuch der chemischen Technologie und Metallurgie. 3., neu bearbeit. und erweit. Aufl.* 1939. 2 vols., 1280 p., illus. (Original price, $38.50) **Price: $28.50**

KUEHNEL, REINHOLD: *Werkstoffe für Gleitlager.* 1939. ix, 427, 1 p. incl. illus., tables, diagrams. (Original price, $15.92) **Price: $8.65**

FLUEGGE, WILHELM: *Statik und Dynamik der Schalen.* 1934. vii, 240 p., illus., diagrams. (Original price, $9.00) **Price: $5.75**

JOST, WILHELM: *Explosions- und Verbrennungsvorgänge in Gasen.* 1939. viii, 608 p., incl. illus., tables, diagrams. (Original price, $19.80) **Price: $15.00**

BEYLING, CARL: *Sprengstoffe und Zündmittel.* 1936. viii, 465, 1 p., illus., diagrams. (Original price $14.40) **Price: $8.20**

HANSEN, MAX: *Der Aufbau der Zweistofflegierungen.* 1936. xv, 1100 p. (Original price $34.80) **Price: $16.25**

BAUER, OSWALD and KROEHNKE, and MASING: *Die Korrosion metallischer Werkstoffe.* 1936-1940. 3 vols., illus., tables, diagrams.

Vol. 1: *Die Korrosion das Eisens und seiner Legierungen.* xxii, 560 p. **Price: $13.65**

Vol. 2: *Die Korrosion von Nichteisenmetallen und deren Legierungen*, xxx, 901 p. **Price: $22.50**

Vol. 3: *Der Korrosionsschutz metallischer Werkstoffe und ihrer Legierungen.* xxiv, 615 p. **Price: $14.50**

Entire Set (Original price $63.50) **Price: $49.75**

ARKEL, ANTON EDUARD van, ed.: *Reine Metalle. Herstellung, Eigenschaften, Verwendung.* 1939. vii, 574 p., illus. (Original price, $20.00) **Price: $12.50**

BURKHARDT, ARTHUR: *Technologie der Zinklegierungen. 2. erweit Aufl.* 1937. xii, 256 p. incl. illus., tables, diagrams. (Original price, $15.12) **Price: $10.65**

Prices are f.o.b. Ann Arbor, Mich.; 2% discount for cash with order. Circulars describing the 55 titles in detail will be mailed on request.

EDWARDS BROS., INC.
Lithoprinters and Publishers
Ann Arbor, Michigan

Cut in Report Forms Being Sought by WPB

Washington

• • • **A determined effort** to simplify and reduce to a minimum report forms required of the steel industry was announced today by John T. Whiting, director of the WPB Steel Division. In line with this purpose the functions and scope of the Control Branch of the Division have been considerably increased.

Included in the Control Branch is a Research and Review Section which will constantly review the need and usage by the Steel Division of all reports, study the possibilities of simplifying and where possible, eliminate reporting. Greater use will be made of basic reports such as capacity and production reports, production directive reports, and shipment and past-due order reports so as to secure from them as much information as is practicable and keep to a minimum all special reports except for emergency situations.

•

New Questionnaires And Reports Issued by WPB

Washington

• • • **WPB has issued** the following new questionnaires or report forms during the past week.

WPB-653 Summary of steel plate order reports. Monthly.
WPB-652 Monthly steel plate order report.
CMP-4-B Controlled materials: Application for and/or change in authorized production schedule.
WPB-3205 Bronze welding rods: Supplier's quarterly report of actual, proposed and authorized shipments pursuant to M-293.
GA-298 Summary of CMP-48 applications for allotment of controlled materials for 4th quarter 1943.
WPB-3196 Iron and steel: Producers' application for authority to make extraordinary repairs or replacements.
WPB-732-A Report of operations due on or before the 25th of each month.
WPB-732 Report of operations due Sept. 25, 1943.
GA-596 Affidavit and application for establishment of initial zero quotas.
WPB-2766 Producers' report of Lend-Lease iron and steel shipments and forecast.
WPB-2934 Ferro-alloys required for melting schedule. Monthly.
WPB-2938 Coal mines: Application for quarterly quotas for maintenance, repair, and operating supplies for first quarter 1944.
WPB-2939 Non-metallic mines: Application for quotas for maintenance, repair and operating supplies for first quarter 1944.
WPB-2933 Alloy steel melting schedule. Monthly.
WPB-2040 Non-ferrous smelters and refineries: Application for quarterly quota for maintenance, repair, and operating supplies first quarter 1944.
WPB-2937 Metal mines: Application for quotas for maintenance, repair, and operating supplies for first quarter 1944.
WPB-2206 Inventory record card-1043.
WPB-1583 Structural steel shapes and steel sheet piling weekly proposed rolling schedule.
WPB-2997 Steel tubing for engine bearings: Application and allocation.
WPB-1041 Application for authorization to contract or arrange for importation of strategic materials.

prevent pressure losses

• In force-feed lubrication of bearings, use *babbitt-tipped* Laminum shims to prevent oil and pressure losses. Shims cut to your specifications provide accurate laminations for quick precision adjustment.

Shims cut to your specifications. Stock shim materials obtainable from your dealer. Write us for further information and shim application chart.

Laminated Shim Company
Incorporated
76 Union Street • Glenbrook, Conn.

LAMINUM
THE SOLID SHIM THAT peels FOR ADJUSTMENT
2045

KENNAMETAL the *fastest* cutting tool in the steel-machining industry

The introduction of KENNAMETAL steel-cutting carbide tools in 1938 has proved to be one of the major contributions to today's enormous production of machined steel parts. KENNAMETAL has increased plant output by consistently reducing floor to floor time on all steel-cutting jobs.

One customer writes us, "We have done jobs here with Kennametal, that otherwise we would have to pass up. . . . The ordinary tool just will not touch this type of material, the edge turns over at once. We are for Kennametal 100%."

Because of its great strength and hardness, and superior wear-resistance qualities, KENNAMETAL can efficiently face, bore, turn, or mill any job with a 30 to 50% saving in time over other cutting tools. KENNAMETAL reduces the number of cuts required by permitting the use of heavier feeds and high peripheral speeds. KENNAMETAL also roughs and finishes in one cut on many operations.

To increase your production of machined-steel parts use KENNAMETAL—the tool of greater output per man hour; the tool that cuts more steel in less time.

Write for your copy of the KENNAMETAL Catalog 43B. It contains information on the care and use of KENNAMETAL carbide tools and blanks.

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Trade Mark Reg. U. S. Pat. Off.

Foreign Sales: U. S. STEEL EXPORT CO., 30 Church St., New York (Exclusive of Canada and Great Britain)

More DPC Contract Awards Announced

Washington

• • • **Defense Plant Corp.**, RFC subsidiary, has authorized the following contracts: Revere Copper & Brass, Inc., N. Y., to construct a plant in Maryland at a cost in excess of $6,000,000.

An increase in its contract with the Chicago Chemical Co., Chicago, to provide additional facilities at a plant in Illinois at a cost of approximately $30,000, resulting in an over-all commitment of about $875,000.

An increase in its contract with the Iron Fireman Mfg. Co., Portland, Ore., to provide additional equipment at a plant in Oregon at a cost of approximately $70,000, resulting in an over-all commitment of about $600,000.

Willys-Overland Motors, Inc., Toledo, to provide additional equipment at a plant in Ohio at a cost in excess of $460,000, making a total commitment of more than $2,600,000.

Bower Roller Bearing Co., Detroit, to provide additional equipment at a plant in Michigan at a cost in excess of $165,000, making a total commitment of more than $1,200,000.

Douglas Aircraft Co., Inc., Santa Monica, Cal., to provide additional plant facilities in California at a cost in excess of $250,000, making a total commitment of more than $980,000.

Cheplin Biological Laboratories, Inc., Syracuse, N. Y., to provide plant facilities in New York at a cost in excess of $850,000.

Sunstrand Machine Tool Co., Rockford, Ill., to provide additional facilities at a plant in Illinois at a cost in excess of $370,000, making a total commitment of more than $800,000.

Franklin Machine & Foundry Co., Providence, to provide equipment at a plant in Rhode Island at a cost in excess of $40,000.

General Motors Corp., Detroit, to provide additional facilities at plants in Indiana and Michigan at a cost in excess of $5,000,000, making a total commitment of more than $72,000,000.

Wright Aeronautical Corp., Paterson, N. J., to provide additional equipment at plants in New Jersey at a cost in excess of $5,500,000, making a total commitment of more than $45,000,000.

Boeing Aircraft Co., Seattle, to provide additional facilities at a plant in Washington at a cost in excess of $650,000, making a total commitment of more than $1,150,000.

Grain processing Corp., Muscatine, Iowa, to provide additional facilities at a plant in Iowa at a cost in excess of $270,000, making a total commitment of more than $1,490,000.

Phoenix Iron Co., Phoenixville, Pa., to provide equipment at a plant in Pennsylvania at a cost in excess of $580,000.

Air Products, Inc., Detroit, to provide plant facilities in Tennessee at a cost in excess of $550,000.

Kansas City Public Service Co., Kansas City, to provide additional transportation facilities in Missouri at a cost in excess of $450,000.

An increase in its contract with International Industries, Inc., Ann Arbor, Mich., to provide additional facilities at a plant in Michigan at a cost of approximately $25,000, resulting in an overall commitment of approximately $195,000.

An increase in its contract with the United States Industrial Chemicals, Inc., New York, to provide additional equipment at a plant in Maryland at a cost of approximately $55,000, resulting in an overall commitment of approximately $300,000.

An increase in its contract with Ford Motor Co., Dearborn, Mich., to provide additional equipment at a plant in Michigan at a cost of approximately $340,000, resulting in an overall commitment of approximately $68,000,000.

An increase in its contract with E. I. du Pont de Nemours & Co., Wilmington, Del., to provide additional machinery at a plant in New York at a cost of approximately $345,000, resulting in an overall commitment of approximately $2,500,000.

•

War Dept. Awards

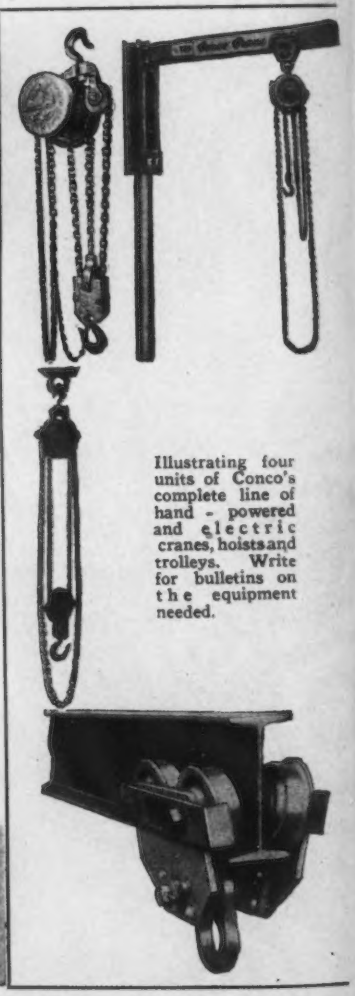
• • • **The War Department** announced Sept. 2:

Award of a contract to Paschen Contractors, Inc., Chicago, for construction at a military installation in Cook County, Ill., to cost in excess of one million dollars. This work is to be supervised by the Chicago office of the Corps of Engineers.

Award of a contract to Sound Construction, Ford J. Twaits and Morrison Knudsen Co., Seattle, for construction at a military installation in King County, Washington, to cost in excess of one million dollars. This work is to be supervised by the Seattle office of the Engineers.

Here's Safe Easy Strength... FOR THE WEAKER SEX

The Conco Torpedo Electric Hoist has many features which adapt it ideally to operation by women. First, push button control allows for easy, one-hand operation. Double cast iron drums balance the load with a minimum of effort from the operator. An electric brake and positive limit switch are important safety features. Available for prompt delivery in 250-, 500- and 1000-lb. capacities for hook, bolt or trolley suspension. Write for bulletins.



Illustrating four units of Conco's complete line of hand - powered and electric cranes, hoists and trolleys. Write for bulletins on the equipment needed.

CONCO ENGINEERING WORKS

Division of H. D. Conkey & Company

15 GROVE STREET, MENDOTA, ILLINOIS

HOW TO SELECT THE RIGHT CUTTING FLUID

1. **For Machining Nickel Steel,** and ductile steels generally, if the cutting operation produces a curling chip that bears heavily on the face of the cutting tool, use a cutting fluid high in anti-weld and anti-friction properties. Such properties are generally found in sulpho-chlorinated oils containing some saponifiable material. If visibility and ease of inspection are also of importance the oil should be of the transparent type. Chillo oils No. 140 or No. 143 will be found particularly adapted for service of this kind.

2. **For Similar Operations** but where transparency is not a factor and where the work warrants the use of a lower priced product of the sulpho-chlorinated type, without saponifiable material, we recommend Cities Service Grade A Cutting Oil. This oil has many satisfied users.

3. **For Less Severe Operations** these base oils can be had in milder concentrations to meet varying requirements—of tool life, finish, cost, etc.

4. **If Maximum Protection Against Staining** is a factor, or if a high degree of transparency is desired, in moderately severe operations, a mineral-lard oil in varying proportions, like Chillo Oils 1 to 5, will be found particularly applicable for the purpose.

5. **Where Cooling Is Of Paramount Importance**—as in grinding operations—to assure accuracy and prevent distortion—oil-water emulsions frequently are desired. This type of cutting fluid is also often selected for operations where cost is a deciding factor. We suggest Cities Service Soluble Oil for these requirements.

Call your nearest Cities Service Office today—ask to have a Lubrication Engineer prove the value of these products on your own equipment. There is no cost or obligation.

FOR COMPLETE CUTTING OIL MANUAL, WRITE TO CITIES SERVICE OIL COMPANY, SIXTY WALL TOWER, ROOM 1693, NEW YORK 5, NEW YORK. FREE TO THE PERSONNEL OF USERS OF CUTTING OILS.

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★ ★ OIL IS AMMUNITION—USE IT WISELY! ★ ★

Absorbed 578% of its weight in oil!

After 24 hours' immersion in S.A.E. 20 oil, wick specimens (each .25" diam. x 30" long) of six different types of Booth "prescription" felts were surface-drained and then weighed. Oil absorption as high as 578% of the original weight of specimen was recorded.

Various Booth felt tests, by independent laboratories, may give you new angles on felt. Ask for copies of the reports.

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477 19th Street Brooklyn, N. Y.
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APPLICATION CHART AND SAMPLE KIT . . . Contains swatches of S.A.E. felt types, with specification tables. Write for it. (No sales follow-up.)

2074

Booth
TRADE MARK
PRECISION CUT FELT PARTS

35 Lb. of Metal Makes New Army Jive Box

Washington

• • • A new type of piano, containing only 35 lb. of metal to conform to the WPB order limiting the amount of metal to 10 per cent of the weight of the instrument, is being procured by the Quartermaster Corps for the use of troops in the United States and overseas, the War Department has announced. The saving of metal, amounting to 150 lb. per instrument, is realized principally through the use of laminated plywood instead of metal in the heavy plate, the part to which the strings are attached. The new piano is slightly less than 5 ft. high and has a 73-note keyboard.

Forgings Classification More Clearly Defined

Washington

• • • THE IRON AGE of Sept. 9 was in error in its interpretation of Direction 25 to CMP Reg. I when it said that steel forgings are considered controlled material when sold by a steel producer and by a distributor, regardless of who produced the forgings. The direction covers only steel products that are produced in controlled material form by a forging process.

It sets up the following rules as applying to steel products which are produced in controlled material form by a forging process:

1. When sold by a steel producer they are controlled material.
2. When sold by a forger who is not a steel producer they are Class A products.
3. When sold by a distributor they are controlled material regardless of who produced them.

There has been no change in the classification of other forgings.

COMING EVENTS

Sept. 28 to 30—Iron and Steel Engineers convention, Pittsburgh.
Oct. 1, 2—Electric Steel Furnace Committee, AIME, Pittsburgh.
Oct. 5, 6—Gray Iron Founders' Society, Cincinnati.
Oct. 5, 6, 7—National Safety Congress, Chicago.
Oct. 11, 12—American Society of Tool Engineers, Indianapolis.
Oct. 13 to 16—The Electrochemical Society, Inc., New York.
Oct. 14, 15—American Machine Tool Distributors' Association, Montebello, P. Q., Canada.
Oct. 18 to 22—National Metal Congress and Exposition, Chicago.
Nov. 10, 11—Industrial Hygiene Foundation, Pittsburgh.

DO YOU KNOW THE TRUTH about Hardness Testing?

• The new Clark catalog is more than a catalog.

It is a 20-page reference manual on the history, theory, practice, and equipment for modern, scientific hardness testing. Printed in two colors, size 8½" x 11", it is available without charge to manufacturing executives. Just drop a line on your letterhead to Department IA, CLARK INSTRUMENT, INC., 10200 Ford Road, Dearborn, Michigan.

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TOMORROW'S ACCURACY TODAY
HARDNESS TESTER

We learned *This* from War Production

The mere lifting and moving of heavy loads is one thing. But production *organized* for the swift, steady flow of materials with modern P&H Electric Cranes is quite another.

This lesson, learned in gearing up for war's urgencies, will serve us well in the years ahead. For it showed us how to save time—how to keep men and machines at full earning capacity—and how to cut our manufacturing costs.

A new star has been added to P&H's award for excellence in war production.

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P&H is America's largest and only crane builder producing complete electrical crane equipment.

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rivets are made in all sizes, heads, materials. Accurate dimensions, uniform material. Widely used by leading manufacturers.
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IRON AND STEEL
Corporation
PITTSBURGH, PENNSYLVANIA
BOLTS . . . NUTS . . . RIVETS
STEEL FASTENERS

Gray Iron Founders' Board Candidates Named

• • • **Regular-slate candidates** for six three-year term posts on the board of directors of the Gray Iron Founders' Society, to be filled at the fifteenth annual meeting of the association in Cincinnati, Oct. 5-6, were announced recently by W. W. Rose, executive vice-president. Nominating committee selections are:

C. R. Culling, president, Carondelet Foundry Co., St. Louis; Ronald E. Kucher, vice-president, Olympic Foundry Co., Seattle; S. C. Mefford, treasurer, Auburn Foundry, Inc., Auburn, Ind.; R. D. Phelps, president, Francis & Nygren Foundry Co., Chicago; Edward L. Roth, president, Motor Castings Co., Milwaukee; and Walter L. Seelbach, vice-president and general manager, Forest City Foundries Co., Cleveland.

Directors retiring following the 1943 annual meeting are:

A. C. Denison, Fulton Foundry & Machine Co., Inc., Cleveland, president of the society; B. D. Claffey, gray iron division, General Malleable Corp., Waukesha, Wis., the association's vice-president; M. A. Fisher, Standard Buffalo Foundry, Inc., Buffalo; C. B. McGrath, Greenlee Foundry and North Western Foundry Co., Chicago; A. J. Rumley, LaPorte Foundry Co., LaPorte, Ind.; and H. A. Torrence, Indiana Foundry Co., Indiana, Pa.

Production and Cost Control

(CONCLUDED FROM PAGE 72)

case of subassemblies, where the assembly time is always charged to the main part involved.

It should be emphasized that it is not the intention of this article to present a finished blueprint or pattern for setting up a production control in any small or medium size plant. Every industrial organizer will agree that hardly two existing plants can use exactly the same method of organization. Therefore, it is to be understood that only an example has been drawn up, showing how the problems involved have been attacked and overcome in a simple, accurate and relatively inexpensive way. The method in general has proved flexible enough to be accommodated to the need of almost any small plant, and even jig, die and pattern costs can be fixed easily with the same setup.

It is suggested that a few sample forms be multigraphed first in order to find weak spots in the handling, or to iron out possible difficulties which cannot be foreseen when the pattern of the forms is laid out. All employees should be instructed to follow strictly the chosen system, because a slight relaxation from the rules can cause confusion, loss of time and upset the whole effort.

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OLIVER
headed and threaded products accurately made to close tolerances. Bolts, nuts, cap screws, studs; carbon steel and alloys. All sizes.
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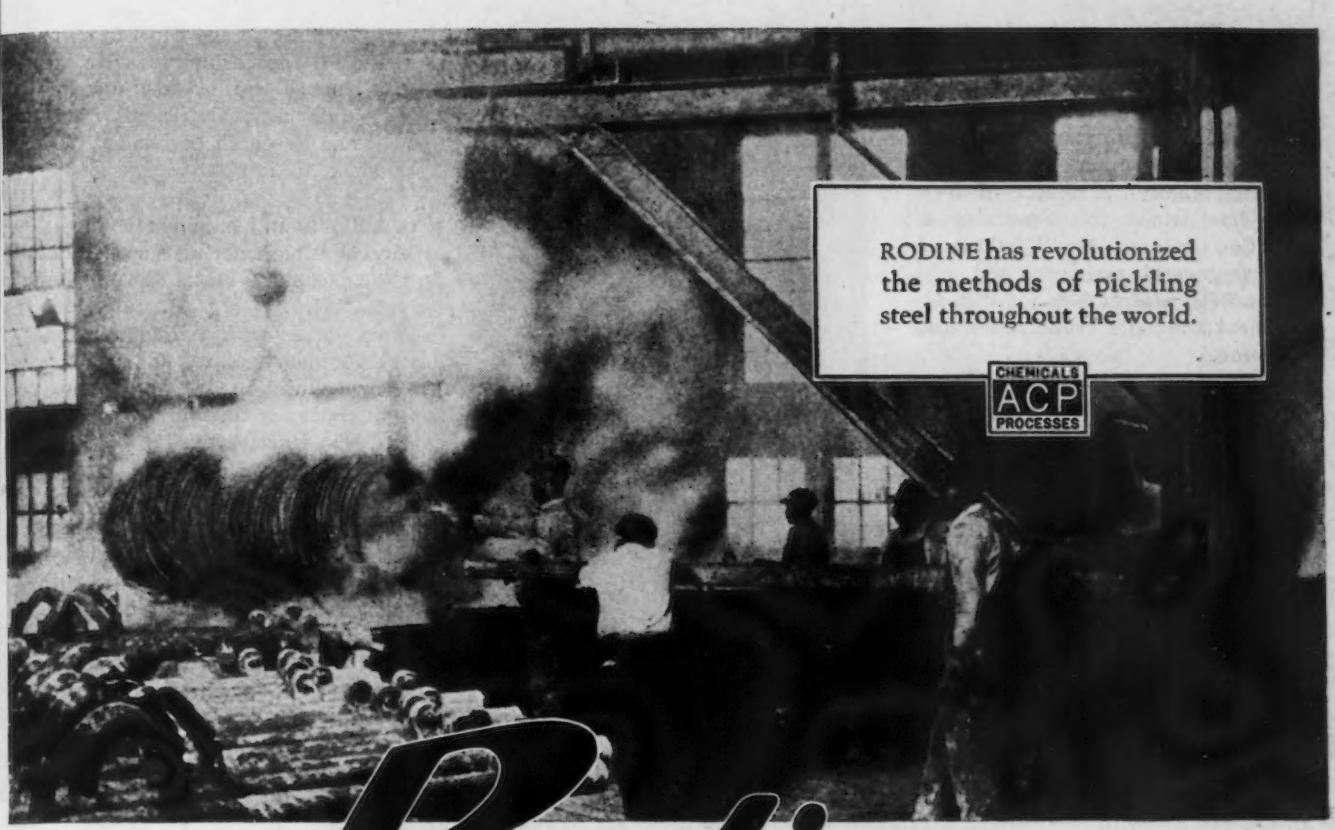
IRON AND STEEL
Corporation
PITTSBURGH, PENNSYLVANIA
BOLTS . . . NUTS . . . RIVETS
STEEL FASTENERS



Rodine

YOUR SAFETY FACTOR

Speed up Pickling to Meet War Schedules Without Danger of Over Pickling

The RODINE controlled acid bath enables you to clean more metal in less time and eliminates spoilage from over pickling even though your labor is uncertain during this manpower shortage.

RODINE is an *inhibitor* which effectually controls the acid in the pickling bath confining its action to removing the mill scale or rust, and preventing its attack on clean metal. RODINE is not new—it has revolutionized the methods of pickling steel all over the world.

Outstanding Advantages of RODINE:

- **Metal is not wasted in pickling**
- **Acid is not wasted dissolving good metal**
- **The Metal is not pitted or "burned"**
- **Over pickling is eliminated**
- **Pickled surfaces are bright and clean**
- **Acid brittleness is minimized**
- **The atmosphere is not contaminated with noxious gases**
- **Corrosion of steel-work in pickling house is reduced**

There are various types ot RODINE to meet different requirements in operation. The ACP engineers will recommend the proper grade for your particular use. They will also be glad to cooperate in solution of any problems concerning cleaning or finishing of metal.

Manufacturers of Inhibitors & Metal Working Chemicals

AMERICAN CHEMICAL PAINT CO.
AMBLER ACP **PENNA.**

Note: West Coast Plants may address inquiries and orders for prompt delivery to, Leon Finch, Ltd., 728 East 59th St., Los Angeles, Calif.

American Chemical Paint Company, Ambler, Pa.

Please send me general Technical Service Data Sheets on

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*Company*_____

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EE-9

PERSONALS

• **Harry T. Worthington,** formerly a sales and production executive of Manning, Maxwell & Moore of New York, has joined the Beardsley & Piper Co., Chicago. Mr. Worthington becomes general manager, and will direct special attention to product development and sales organization and promotion.

• **Herbert Davis** has been appointed metallurgist by the Hi-Alloy Castings Co., New Brighton, Pa. Prior to coming with the company he was assistant superintendent in charge of the seamless hot mills at the Youngstown Sheet & Tube Co., Youngstown, Ohio.

• **Frank R. Dedrick,** medical and safety director of the Bullard Co., Bridgeport, Conn., has been nominated as a member of the engineering committee of the automotive and machine shop section, National Safety Council.

• **E. H. Howell,** manager of General Electric's Toledo office for the past 13 years, has been appointed manager of the company's Meter and Instrument Division. Mr. Howell succeeds **W. F. Howe,** a veteran of 43 years' service, who is relinquishing his responsibilities but will continue as a full-time consultant of the division. **S. J. Tombaugh,** sales engineer of the Cleveland office, has been named manager of the company's Toledo office, succeeding Mr. Howell.

HARRY T. WORTHINGTON, general manager of the Beardsley & Piper Co., Chicago.

• **Albert C. Fetzer,** vice-president of Mack Mfg. Corp., has been made a member of the OPA truck manufacturers' advisory committee.

• **T. H. Wickenden** has been appointed manager of the development and research division of the International Nickel Co. **H. J. French** has been made assistant manager. Mr. Wickenden, who has been assistant manager since 1931, succeeds the late Albion James Wadhams. He was formerly in charge of engineering at Studebaker Corp.'s South Bend plant from 1913 to 1920. Mr. French is temporarily serving in the Steel Division of the WPB in Washington. He has been in charge of alloy steel development in International Nickel's Development and Research Division at New York since 1932.

• **C. A. Hartman** has joined the metallurgical and engineering service staff of the Meehanite Metal Corp., New Rochelle, N. Y. Mr. Hartman has been connected with the foundry industry for many years, and prior to his new connection, he was foundry superintendent of the Harrisburg Machine Corp., Harrisburg, Pa.

• **D. B. Meadows** has been made manager of the production and facilities department of WPB at Detroit. Prior to joining WPB last year he was with Lincoln, Briggs & Fruehauf Co. **A. J. Stenger** was named the Detroit management-consultant division representative. He organized the Stenger Bumper & Mfg. Co., from which he retired in 1939.

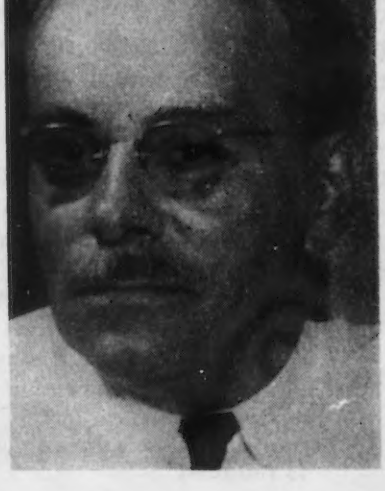
• **L. E. Hammer** has joined the Worthington Pump & Machinery Corp. as assistant works manager of its Moore Steam Turbine Division, Wellsville, N. Y.

• **William L. Schrader,** production assistant to the vice-president of the Kellett Aircraft Corp., Upper Darby, Pa., has been made general factory manager. Prior to coming to Kellett, Mr. Schrader was factory manager for P. R. Mallory & Co., Inc., Indianapolis.

E. H. HOWELL, manager of the Meter and Instrument Division of General Electric Co., Schenectady, N. Y.

S. J. TOMBAUGH, manager of the Toledo office of General Electric Co.

WILLIAM L. SCHRADER, general factory manager of the Kellett Aircraft Corp., Upper Darby, Pa.



• **Robert T. Keller** has been made works manager of the Tank Arsenal, Chrysler Corp., to replace **M. J. Leonard.** Mr. Keller, who has been with the company since 1934, was formerly staff engineer of the Arsenal. Mr. Leonard is being transferred to other unspecified duties.

• **R. J. Nadherny** has been made production manager of Athey Truss Wheel Co., Chicago. Mr. Nadherny was formerly with the sales engineering department of the Mercury Mfg. Co., Chicago.

• **Philip B. Stull** has been elected vice-president of the Hercules Powder Co., Wilmington, Del. Mr. Stull became associated with Hercules in 1926 when the Virginia Cellulose Co. of which he was president, was acquired. He was formerly general manager of the paper makers chemical department of Hercules. **Ralph B. McKinney** will succeed Mr. Stull as general manager of the department. Mr. McKinney has been with the company for 31 years.

• **Harold J. Mollenberg** has been elected president of the Mollenberg-Betz Machine Co., Inc., Buffalo, to succeed his father, the late Henry J. Mollenberg. **Jacob Betz** has been elected chairman of the board and will continue as treasurer. **Jacob H. Betz,** the chairman's son, has been named secretary-assistant treasurer and **Richard H. Mollenberg** has been re-elected vice-president.

• **C. N. Guerasimoff,** formerly assistant chief engineer, has been appointed chief engineer of the engine division, Buda Co., Harvey, Ill. Mr. Guerasimoff has been with the company for the past nine years during which time he has served as mathematician, engineer on stress analysis, and design engineer on gasoline and diesel engines. In 1941 he was appointed assistant chief engineer in charge of the radial diesel engine division.

• **Ralph Stowell,** for the past year Washington representative of the Pratt & Whitney Division, Niles-Bement-Pond Co., will leave soon for North Africa where he will represent the company.

• **Harry Patton,** for seven years Indian Motorcycle Co. district manager for New York, New Jersey and Pennsylvania, has been appointed national director of sales for that company. He replaces James A. Wright, who resigned Aug. 1.

ROBERT T. KELLER, works manager of the Chrysler Tank Arsenal, Chrysler Corp., Detroit.

• **Arthur E. Murton** has been made manager of the Roll Department, Continental Roll & Steel Foundry Co.

• **Bryan C. S. Elliott** has been made supervisor, tax division, of Carnegie-Illinois Corp., Pittsburgh. Mr. Elliott has been with Carnegie-Illinois since 1941, when he was employed as chief of the bureau of taxes. Previously he maintained an office for the practice of law and accounting in Pittsburgh, specializing in tax matters.

• **U. Stanley Ackles** has been appointed manufacturer's representative, National Screw & Mfg. Co., Cleveland, for Washington, Oregon and British Columbia. Mr. Ackles was formerly with the Fisher Body Co. in Detroit. His new headquarters are at 203 Fourth and Cherry Building, Seattle.

• **William C. Cuntz** has been made district manager, welding division, Metal & Thermit Corp., New York. His headquarters will be at the Pittsburgh office. Mr. Cuntz joined the company in 1936 and has been engaged in sales and service work in connection with Thermit welding and Murex electrodes since 1937. **Louis G. Vock** and **James M. Wilson** have been appointed district engineers for the company. Mr. Vock will operate from the corporation's Chicago branch and Mr. Wilson from its Pittsburgh branch. Both men have served the company for many years in the capacity of service engineers.

• **Malcolm G. Kirk** has been made manager of the Norristown, Pa., American Equipment Division, Pittsburgh Screw & Bolt Corp. Mr. Kirk managed the priorities section of the corporation prior to assuming his new responsibilities and is well known among the trade, having been a member of the company's sales staff for more than six years past. His appointment follows the recent retirement of **John A. Longacre.**

• **Lewis F. Jeffers,** industrial banking executive at Birmingham, Ala., has been appointed public relations director of the Birmingham plant by Bechtel-McCone-Parsons Corp.

• **J. M. Tucker,** who recently joined the Massey-Harris Co., Racine, Wis., as assistant to the general sales manager, has been appointed general sales manager to succeed **E. F. Schiele,** who has resigned. Both Mr. Tucker and **C. E. Krause,** secretary and director of purchases, have been elected to the board of directors of the firm.

OBITUARY...

• **J. H. Schroeder,** traffic manager of the Tennessee Coal, Iron & Railroad Co., died recently. Mr. Schroeder came to Birmingham from Pittsburgh in 1933 as assistant traffic manager. In 1938 he was made traffic manager of the Tennessee Company.

• **George W. Crist,** resident engineer for the Cleveland Graphite Bronze Co. since 1926, died recently. Before his association with Cleveland Graphite Bronze, Mr. Crist was with Studebaker and General Motors Corp.

• **J. C. Bench,** superintendent of all mechanical departments of the Minnequa Steel Plant, Colorado Fuel & Iron Corp., Pueblo, Col., died recently. He had been with the company 55 years, and was associated in the construction of the Gary Steel Plant. He was 69 years of age.

• **Harry C. Tillotson,** founder and president of the Tillotson Mfg. Co., died at Toledo, Sept. 1. He was 76 years old, and had founded the company in 1914 after inventing the Tillotson carburetor.

• **James E. McMahon,** manager of sales, Rockwood Sprinkler Co., died in Worcester, Mass., Sept. 1.

• **Hugh A. Todd,** New York representative for Hanson - Van - Winkle - Munning Co., died recently. He had been associated with the company for 40 years.

MACHINE TOOLS

. . . News and Market Activities

Amendments to Renegotiation Act Urged

Cleveland

• • • **Machine tool builders** have a great deal at stake in renegotiation, perhaps more than any other industry, so that it is not surprising to find the National Machine Tool Builders Association in the forefront in urging revisions in the renegotiation law. Some excellent arguments have been brought out in the pamphlet just issued by the association under the title, "Renegotiation." The methods employed by the various price adjustment boards in carrying out the renegotiation law are criticized in no uncertain terms, just at a time when congressional committees are resuming hearings on the subject.

Because the machine tool industry was the guinea pig in renegotiation, members of the industry feel, possibly with a great deal of justification, that renegotiation as practiced by the various Price Adjustment Boards has been unnecessarily harsh. This feeling is not one that just grew up through the association of members of the industry with one another; individual companies have specific reasons to fear the effects of renegotiation that are peculiar to the company as well as to the industry as a whole, and these fears in many instances are widely diversified.

One of the nation's largest builders of planers took the time to work out a table showing planer production and use in the United States during the past 30 years. Taking into consideration post-war development and even inflating its needs a bit, the table clearly indicated that planer production in the past five years has been sufficient to warrant discontinuing production by the entire industry for at least 10 years after the close of the war. With severe renegotiation superimposed on this problem alone, planer manufacturers must look to pretty dark days ahead.

Another builder, producing turret lathes, showed conclusively that cash reserves of the company had been pretty well drained during the time that the company was trying to increase productive capacity of its plants. Renegotiation just about cleans out the remainder of the available cash of the company, and to go into any different work or to meet any immediate cash needs, it might be necessary to liquidate some of the companys' real assets. This is not always as easy as it sounds. The prospect of facing such a situation is difficult and tends to weaken a company by taking away its working capital. From the standpoint of machine tool dealers, the lopping off of such large amounts might place the dealer in the position of finding it difficult to meet even operating expenses.

•

Rubber Making Machinery Manufacturers Placing Orders

Cleveland

• • • **Steel mills report** that manufacturers of rubber making machinery for synthetic rubber production have been placing substantial orders during the past week and a half for steel. This would indicate that either the present program of rubber making finds itself with too little equipment on hand to meet quotas or the program is being given another shot in the arm to boost synthetic rubber production.

Since deliveries of the steel to the machinery manufacturers is projected in some instances to the first quarter of 1944, it would seem that the buying is for a long pull increase of rubber production. Moreover, the peak in synthetic production under the present program was expected to be reached by Oct. 1.

•

Interpretation Issued On Refrigeration Machinery

Washington

• • • **WPB last Thursday** issued Interpretation 2 to L-38 (Industrial and commercial refrigeration and air-conditioning machinery and equipment) clarifying the following points:

1. In cases where the delivery of equipment is authorized upon condition that Freon 12 may not be used, different equipment in which refrigerants are employed may be purchased provided the equipment is of substantially the same refrigerating capacity. Any incidental additional cost resulting solely from a change to a refrigerant other than Freon 12 is also permissible.

2. Application for delivery authorization calls for the name of the probable supplier and the model number. However, if the application is authorized, the purchaser may obtain a different model from another supplier, provided the equipment is substantially the same as is designed to perform the same function as that for which authorization was sought.

•

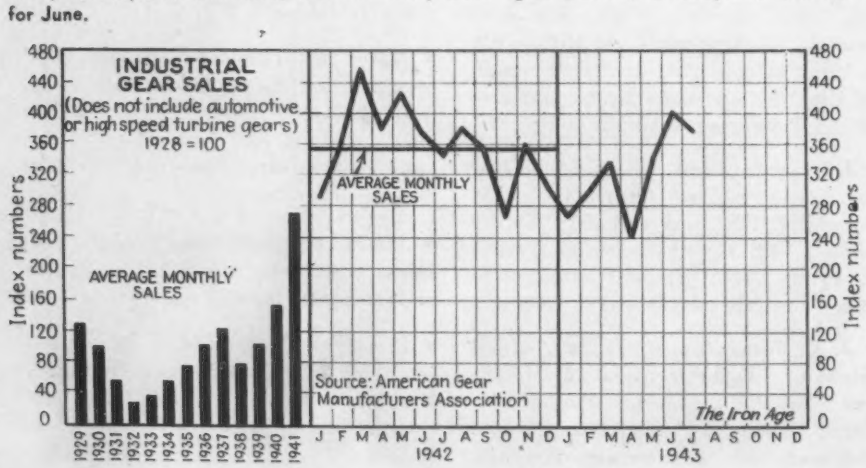
Price Adjustment Job

Washington

• • • **Joseph M. Dodge,** president of the Detroit Bank of Detroit, has been appointed as chairman of the War Department Price Adjustment Board.

Gear Sales Dipped in July

. . . The Gearing Industry as represented by the members of the American Gear Manufacturers Association shows a decrease of 6 7/10 per cent in the business booked in July, 1943, as compared with June, 1943. The July index figure was 374 as compared with 401 for June.

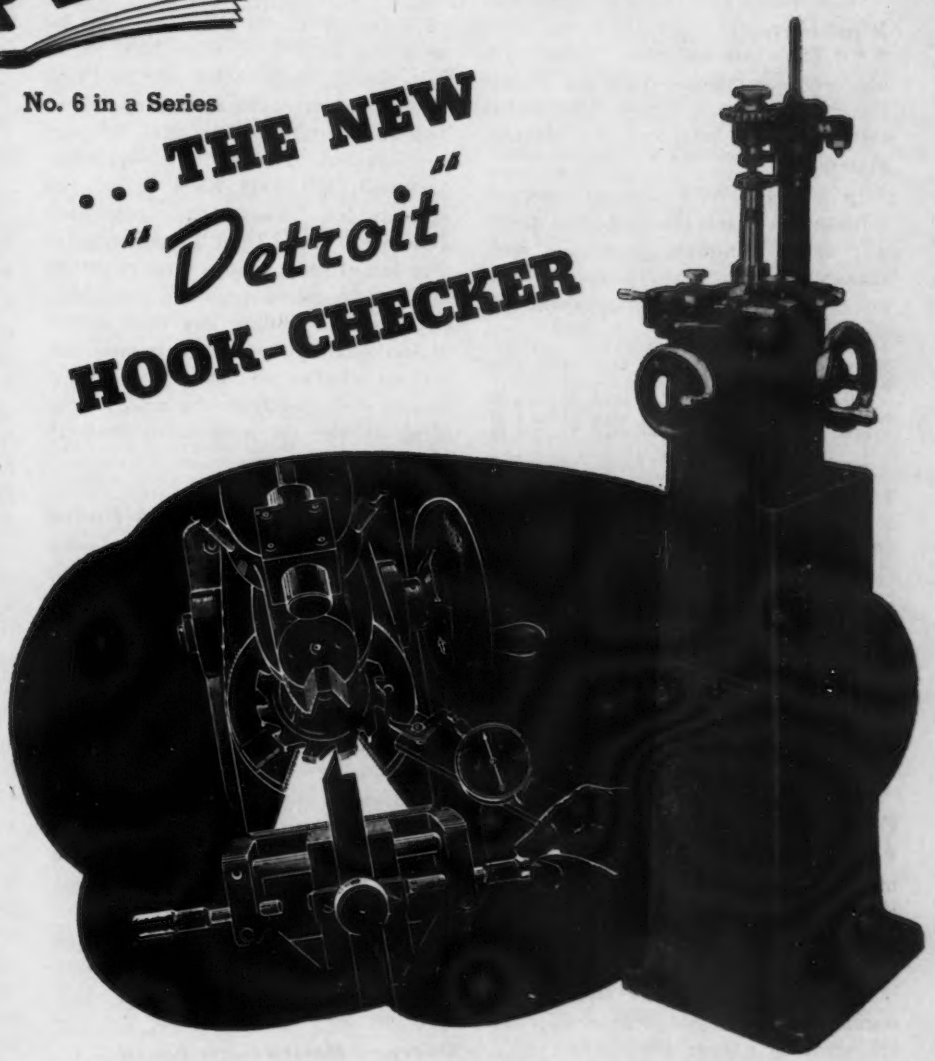


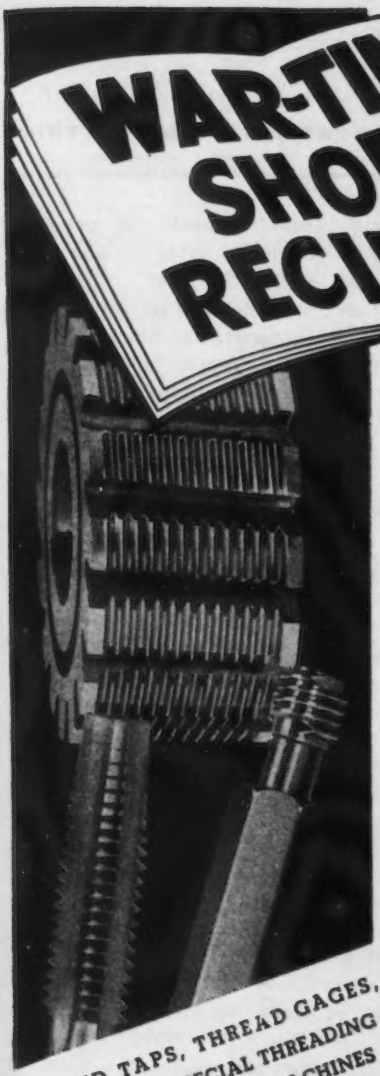
WAR-TIME SHOP RECIPES

TO CHECK YOUR THREAD HOBS FASTER . . . . . .

No. 6 in a Series

. . . THE NEW "Detroit" HOOK-CHECKER





GROUND TAPS, THREAD GAGES, THREAD HOBS & SPECIAL THREADING TOOLS. SPECIAL TAPPING MACHINES

Designed by Detroit Tap and Tool Company to speed production checking of its own thread milling cutters, this new universal hook-checker is being made available to industry generally.

It does not require special setting up for each 'hob'. All you do is slip the cutter between centers, bring a knife edge against the ground side of the sharpened face, by turning a micrometer until you can't see light between the two. Read the 'mike'. A convenient table then tells you whether the cutter is right or how much it is off. A dial tells whether flutes are correctly spaced.

Ask for bulletin No. HC-43 covering this new checker. It also gives useful hints as to sharpening of thread milling cutters.

BUY U.S. BONDS STAMPS

DETROIT TAP & TOOL CO.

8432 BUTLER
DETROIT, 11
MICH. U.S.A.

NON-FERROUS METALS

. . . News and Market Activities

Inco to Buy Nickel Salts for MRC

Washington

• • • **The International Nickel Co.** has been commissioned by the Metals Reserve Co. to purchase idle nickel salts held in inventory by electroplaters.

In a letter WPB requests platers voluntarily to sell idle salts for direct war uses. Minimum quantities purchasable under the program and prices offered by the government are as follows:

Nickel sulphate	300 lb. or over	11.5c. a lb.
Nickel ammonium sulphate	300 lb. or over	10.0c. a lb.
Nickel chloride	100 lb. or over	14.0c. a lb.
Nickel carbonate	100 lb. or over	27.5c. a lb.

Prices quoted are f.o.b. shipping point and apply only to commercially pure salts of standard manufacture, dry, unused, and properly packaged.

Although the program calls for voluntary sales by holders of idle inventories, WPB expects that the recognized need for nickel for war use will prompt an early response by platers and that substantial stocks of needed nickel will be made available for military requirements.

•

Copper and Copper Alloy Scrap

• • • **The weight of copper bearing** material may not be counted toward the weight of material required to receive the quantity premium under Regulation MPR-20 since copper bearing material is exempt from price regulation and is not defined as copper scrap or copper alloy scrap.

Similarly, scrap materials which are covered by other regulations may not be considered in computing the weight necessary for the quantity premium, whether they are received as rejections or as separate lots.

Rejections amounting to more than 10 per cent of the weight of the lot in which they are found must not be included in the weight for which a quantity premium may be paid. The weight of the rejections must be considered only in relation to the weight of the individual *lot* in which they are contained, and not in relation to the weight of the group in which the lot is included or in relation to the entire shipment. The same method must be used to determine whether or not a sorting charge should be made.

For example, a shipment weighing 40,000 lb. net is made up of two lots of different group numbers, one lot weighing 30,000 lb. with 2000 lb. of rejections and the other lot weighing 10,000 lb. with 1500 lb. of repections. The full weight of the first lot may be counted toward the quantity premium, but only 8500 lb. of the second lot, since the rejections amount to more than 10 per cent of that lot. In this case, a total of 38,500 lb. may be counted toward the quantity premium. Being less than 40,000 lb., no quantity premium is paid. A sorting charge of .25c. a lb. must also be deducted from the price of the scrap in the lot with more than 10 per cent rejections.

•

Release of Soldier-Miners Ended

• • • **The release of soldiers** to work in non-ferrous metal mines terminated Sept. 7, with approximately 4550 service men placed in mines through a cooperative agreement among the War Manpower Commission, War Department and WPB.

The releases will help meet the labor shortage in the copper, zinc and molybdenum mines, which are directly engaged in war production.

All releases were on a voluntary basis. Army camps in the 9th Service Command were notified of the agreement and former miners asked to volunteer. Many over the number required responded.

•

Mercury Restrictions Eased

• • • **Appreciable easing** in domestic supplies of mercury due to increased production, completion of Russian requirements, and a safe stockpile, has permitted WPB to allow increased amounts of this material to various classes of users.

Conservation Order M-78 as amended removes from prohibited List A use of mercury for preparations for film developing, treating of green lumber, preparation of vermillion, manufacture of wall switches, wood preservation, thermometers and marine anti-fouling paint. These items are now placed in List B with the allowable use restricted to certain percentages of the base period totals.

Employment of the metal for agricultural uses, health supplies, safety and technical equipment has been transferred from List B (uses which permit utilization up to 100 per cent of the base period total) to the category of unrestricted use.

Other products in List B, such as mercuric fulminate for blasting caps, mercury for industrial and scientific thermometers have their current percentages increased to 200 per cent of the base period total.

•

Lead Prices Defined

• • • **Schedules RPS 69** for primary lead and MPR 70 for secondary lead contain provisions (identical except for the fact that RPS 69 refers to primary and MPR 70 to secondary lead) that sales by plumbing supply houses, in less than carload lots, shall be at prices no higher than those resulting from applying the same percentage markup to the cost of the material as that used on Oct. 1, 1941, or on the last day previous thereto on which a sale of a similar quantity of the same grade of lead took place. It has been called to the attention of OPA that some sellers are under the impression that this markup might be used for carload quantities. This is not the case. The provision regarding plumbing supply houses applies only to less than carload lot sales; if plumbing supply houses should make sales in carload lots, these must be made in accordance with the other provisions of these schedules governing carload lot sales. The maximum prices for all grades of lead in carload lots are the same for all classes of sellers.

•

Al Scrap and Secondary Ingot

• • • **Maximum delivery charges** which may be added to f.o.b. prices for aluminum scrap, set forth in Maximum Price Regulation 2, represent no change from the corresponding provision under Revised Price Schedule 2, as amended .

Delivery charges which may be added to maximum prices on aluminum scrap shipped by rail, in quantities less than carload lots, must be figured on the actual weight of aluminum received by the buyer. This means that, when 20,000 lb. or more, but less than a minimum carload is shipped, the Column III price differential is applicable, but the freight which may be paid is limited to the actual weight of aluminum shipped, prorated on the carload basis.

Refiner, Smelter Quotations

(Cents per lb.)

Copper, electrolytic, Conn. Valley	12.00
Copper, electrolytic, New York	11.75
Copper, Lake	12.00
Tin, Straits, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.67
Lead, St. Louis	6.35
Lead, New York	6.50
Aluminum, virgin 99+%, delivered	15.00
Nickel, electrolytic, base refinery	35.00
Magnesium, 99.9+%, carlots	21.50
Magnesium, 12-in. sticks, carlots	30.00
Cadmium, delivered	90.00

ALUMINUM, No. 12 foundry grade (No. 2), 13.50c. per lb.; steel deoxidizing grades, 12.50c. to 13.75c. per lb. ANTIMONY, Asiatic, New York, nominal; American, 14.50c. a lb., f.o.b. Laredo, Tex., smelter. MERCURY, $191 to $193 per 76-lb. flask, f.o.b. shipping point or port of entry. BRASS INGOTS, commercial 85-5-5-5 (No. 115), 12.25c. a lb. COBALT, 97 to 99 per cent, $2.11 per lb. BERYLLIUM COPPER, 3.75 to 4.25 per cent Be., $15 per lb. contained Be. GOLD, U. S. Treasury, $35 an oz. INDIUM, 99.5 per cent, $10 per troy oz. IRIDIUM, $165 per troy oz. PALLADIUM, $24 per troy oz. PLATINUM, $35 per oz. SILVER, open market, New York, 44.75c. per oz. ARSENIC, prime, white, 99 per cent, 4c. per lb.

Copper, Copper Base Alloys

(Mill base prices)

Sheet: Copper, 20.87c.; high brass, 19.48c.; low brass, 80 per cent, 20.15c.; red brass, 85 per cent, 20.36c.; commercial bronze, 90 per cent, 21.07c., 95 per cent, 21.28c.; manganese bronze, 28.00c.; Muntz metal, 22.75c.; naval brass, 24.50c.; phosphor bronze, grades A, B, 5 per cent, 36.25c.; Everdur, Herculoy, Olympic or equivalent, 26.00c.; nickel silver, 5 per cent, 26.50c.

Rods: Copper, hot rolled, 17.37c.; drawn, 18.37c.; free cutting brass, 15.01c.; low brass, 80 per cent, 20.40c.; red brass, 85 per cent, 20.61c.; commercial bronze, 90 per cent, 21.32c., 95 per cent, 21.53c.; Muntz metal, 18.87c.; naval brass, 19.12c.; phosphor bronze, grades A, B, 5 per cent, 36.50c.; Everdur, Herculoy, Olympic or equivalent, 25.50c.; nickel silver, 5 per cent, 28.75c.

Extruded Shapes: Copper, 20.87c.; architectural bronze, 19.12c.; manganese bronze, 24.00c.; Muntz metal, 20.12c.; naval brass, 20.37c.

ALUMINUM

Tubing: 2 in. O.D. x 0.065 in. wall 2S, 40c. per lb. (½H); 52S, 61c. (O); 24S, 67½c. (T).

Plate: 0.250 in. and heavier; 2S and 3S, 21.2c. per lb.; 52S, 24.2c.; 61S, 22.8c.; 24S. 24.2c.

Flat Sheet: 0.188 in. thickness; 2S and 3S, 22.7c. a lb.; 52S, 26.2c.; 61S, 24.7c.; 24S, 26.7c.

2000-lb. base price for tubing; 30,000-lb. base price for plate, flat stock. Variations from the above gage, size, temper, finish and quantity require extras.

Extruded Shapes: "As extruded" temper; 2000-lb. base price. 2S and 3S, factor No. 1 to 4, 25.5c. per lb.; 14S, factor No. 1 to 4, 35c.; 17S, factor No. 1 to 4, 31c.; 24S, factor No. 1 to 4, 34c.; 53S, factor No. 1 to 4, 28c.; 61S, factor No. 1 to 4, 28½c.

The factor is determined by dividing perimeter of shape by the weight per lineal foot. All prices above are subject to factor number range, temper, length, dimensional tolerances and quantity extras.

Wire, Rod and Bar: Base price; 17ST and 11ST-3, screw machine stock. Rounds: ¼ in., 28½c. per lb.; ½ in., 26c.; 1 in., 24½c.; 2 in., 23c. Hexagonals: ¼ in., 34½c. per lb.; ½ in., 28½c.; 1 in., 25½c.; 2 in., 25½c. 2S, as fabricated, random or standard lengths, ¼ in., 24c. per lb.; ½ in., 25c.; 1 in., 24c.; 2 in., 23c. 24ST, rectangles and squares, random or standard lengths. 0.093-0.187 in. thick by 1.001-2.000 in. wide, 33c. per lb.; 0.751-1.500 in. thick by 2.001-4.000 in. wide, 29c.; 1.501-2.000 in. thick by 4.001-6.000 in. wide, 27½c.

Variation from the above size, temper, finish and quantity require extras.

MAGNESIUM

Sheet, rod, tubes, bars and extruded shapes are subject to individual quotation. Magnesium Metal Turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.; less than 25 lb., 66c. a lb.

NON-FERROUS SCRAP METAL QUOTATIONS

Copper, Copper Base Alloy

(Current OPA maximum prices, cents per lb., f.o.b. point of shipment, plus premiums for quantities and special preparation.)

OPA Group 1	
No. 1 wire, No. 1 heavy copper	9.75
No. 1 tinned copper wire, No. 1 tinned heavy copper	9.75
No. 2 wire, mixed heavy copper	8.75
Copper tuyeres	8.75
Light copper	7.75
Copper borings	9.75
Lead covered copper wire, cable	6.00*
Lead covered telephone, power cable	6.04
Insulated copper	5.10*
OPA Group 2	
Bell metal	15.50
High grade bronze gears	13.25
High grade bronze solids	11.50*
Low lead bronze borings	11.50*
Babbitt lined brass bushings	13.00
High lead bronze solids	10.00*
High lead bronze borings	10.00*
Red trolley wheels	10.75
Tinny (phosphor bronze) borings	10.50
Tinny (phosphor bronze) solids	10.50
Copper-nickel solids and borings	9.25
Bronze paper mill wire cloth	9.50
Aluminum bronze solids	9.00
Soft red brass (No. 1 composition)	9.00
Soft red brass borings (No. 1)	9.00
Gilding metal turnings	8.50
Unlined standard red car boxes	8.25
Lined standard red car boxes	7.75
Cocks and faucets	7.75
Mixed brass screens	7.75
Red brass breakage	7.50
Old nickel silver solids, borings	6.25
Copper lead solids, borings	6.25
Yellow brass castings	6.25
OPA Group 3	
Yellow brass soft sheet clippings	8.625
Yellow rod brass turnings	8.375
Zincy bronze borings	8.00
Zincy bronze solids	8.00
Fired rifle shells	8.25
Brass pipe	8.00
Old rolled brass	7.75
Admiralty condenser tubes	8.00
Muntz metal condenser tubes	7.50
Plated brass sheet, pipe reflectors	7.50
Manganese bronze solids	7.25[1]
	6.25[2]
Manganese bronze borings	6.50[1]
	5.50[2]
OPA Group 4	
Automobile radiators	7.00
OPA Group 5	
Refinery brass	5.00*

*Price varies with analysis. [1] Lead content 0.00 to 0.40 per cent. [2] Lead content 0.41 to 1.00 per cent.

Aluminum

(Current OPA maximum prices, cents per lb., for less than 1000 lb. lots, f.o.b. point of shipment, plus premiums for quantities and special preparation.)

Plant scrap, segregated	
2S solids	9.00
All other solids	8.50
Borings and turnings	
Wrought alloys (17S, 18S, 32S, 52S)	7.50
High grade alloys	7.00
Low grade alloys	6.50
Plant scrap, mixed	
All solids	7.50
Borings and turnings	5.50
Obsolete scrap	
Pure cable	9.00
Old sheet and utensils	7.50
Old castings and forgings	8.00
Pistons, free of struts	8.00
Pistons, with struts	6.00
Old alloy sheet	7.00

For lots of 1000 to 19,999 lb., add 1c. to above prices except for old castings and forgings, pistons free of struts, pistons with struts and old alloy sheet for which there is a premium of ½c. a lb. For lots over 19,999 lb. add 1½c. a lb. to prices listed.

Magnesium

Segregated plant scrap	
Pure solids and all other solids, exempt	
Borings and turnings	8.00
Mixed, contaminated plant scrap	
Grade 1 solids	11.00
Grade 1 borings and turnings	7.00
Grade 2 solids	9.00
Grade 2 borings and turnings	5.00

For lots over 1499 lb. add 1c. per lb.

Zinc

(Current OPA maximum prices, cents per lb., f.o.b., shipping point.)

New zinc clippings, trimmings	7.25
Engravers', lithographers' plates	7.25
Old zinc scrap	5.75
Unsweated zinc dross	5.80
Die cast slab	5.80
New die cast scrap	4.95
Radiator grilles, old and new	4.95
Old die cast scrap	4.50

Lead

Soft and hard lead, including cable lead, f.o.b. point of shipment, deduct 0.55c. per lb. from basing point prices for refined metal.

Nickel

Nickel content 98 + per cent, copper under ½ per cent. 26c. per lb.: 90 to 98 per cent nickel, 26c. per lb. contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb., f.o.b. shipping point)

Copper: Cast, elliptical, 15 in. and longer	25½
Electrolytic, full size	22⅞
cut to size	30½
Rolled, oval, straight, 15 in. and longer	23½
Curved	24¼
Brass: Cast, 82-20, elliptical, 15 in. and longer	23⅝
Zinc: Cast, 99.99, 16 in. and over	16¼
Nickel: 99% plus, cast	47
Rolled, depolarized	48
Silver: Rolled, 999 fine per Troy (1-9) oz., per oz.	58

Chemicals

(Cents per lb., delivery from New York)

Copper cyanide, tech., 100-lb. bbls. 1-5	5.65
Copper sulphate, 99.5 crystals, bbls.	13.00–13.50
Nickel salts, single, 425-lb. bbls.	34.00
Silver cyanide, 100 oz. lots	40.82–41.125
Sodium cyanide, 96% dom., 100-lb. dms.	0.15
Zinc cyanide, 100-lb. dms.	33.00
Zinc sulphate, 89% crystals, bbls.	6.80

SCRAP

. . . News and Market Activities

Salvage Drive Quotas Announced

Washington

• • • **In announcing the drive** for 15,000,000 tons of scrap for the last half of 1943, WPB this week said steel mills and suppliers only have about two months' inventory, or about 7,500,000 tons.

The Salvage Division has assigned the following quotas to come from the sources indicated: General salvage, 3,000,000 tons; scrap processors, 800,000 tons; special projects, 1,400,000 tons; industrial, 9,800,000.

To emphasize the need for more scrap, WPB officials reported that shipments of iron ore are off from last year by more than 8,000,000 tons in the Great Lakes area because of the month delay in opening navigation this spring. Also he said the coal strike had resulted in a loss of 300,000 tons of pig iron.

Other reasons for getting out all possible scrap, WPB officials pointed out are as follows: "The present supply that could be expected to come in as a result of ordinary efforts may not be enough to see the mills through the winter. The margin of indicated supply over probable needs is too narrow for safety. A false sense of security has arisen regarding the available scrap inventory. Then too, the amount of production scrap will in all probability decrease, rather than increase. Furthermore, scrap collections have been and will be hampered by other factors. The manpower problem of scrap dealers is far from satisfactory. Some sources of scrap are drying up. New sources such as battlefield scrap, although showing gratifying increases, can at best represent less than 1 per cent of the total goal set for 1943, and will be slow in development."

At the same time, WPB announced the establishment of "Victory Scrap Banks" throughout the nation upon which the steel mills can draw as the metal is needed.

o o o

Referral Hiring Little Help to Yards

Buffalo

• • • **Controlled Referral Hiring,** the manpower-priority system being tried out here, while claimed beneficial by the steel plants and other heavy industries has failed to function helpfully for scrap yards even though they are on the priority list, operators report.

They complain that men who apply direct at the yards are sent somewhere else when they go to the USES for their referral cards. The reason, of course, is that scrap yards cannot pay the money offered by the other plants on the priorities list, and the other fellow's kind of work and pay is more desirable, even if a bit dirty.

Scrap dealers say they are in the middle because OPA ceilings will not allow them to increase wages anywhere near those offered by war plants. To meet war plant wages would force them out of business, they say.

This situation has left many scrap dealers apathetic towards talk of new salvage drives despite WPB's warning a shortage is facing the steel industry. The inability of scrap men to pay high prices for labor already is having its effect on the slowness with which Buffalo steel mills are building up their winter reserve stockpiles. The district's leading scrap consumer, for instance, has a winter stockpile good for only a month whereas it should be good for three months at this stage of the year. Local scrap has decreased alarmingly because of the serious manpower shortage and referral isn't helping a bit.

•

Barringer Outlines Dealers' Job in New Drive

Boston

• • • **Edwin C. Barringer,** president of the Institute of Scrap Iron & Steel, addressed New England members of that organization at Hotel Kenmore, here, Sept. 9, on scrap dealers responsibilities in the coming salvage drive to start some time in October. During the last half of this year the WPB has virtually ignored the general public so far as iron and steel scrap are concerned, concentrating on munition plants, shipyards, battlefield material and abandoned rails for scrap. Mr. Barringer emphasized that the civilian population will be called upon later and that the scrap trade will be expected to double efforts to get material to steel mills.

•

PITTSBURGH—Supplies are not plentiful here. Scrap at other points may be in better balance, but this is a geographical situation. Users here are more interested in remote scrap than they have been for some time. The scrap drive to open soon will have the added impetus of a tighter scrap outlook.

•

CINCINNATI—Yard accumulations are virtually nil, since all that can be prepared leaves the yards as fast as it is ready.

•

BOSTON—Anticipated pickup in business has not developed, the market continuing almost flat so far as new customers getting scrap is concerned. Small shipments of No. 2 steel, turnings, borings, trimming and stampings are going forward on old orders, and occasionally breakable cast. Machinery and textile cast, shafting and stove plate are hard to pick up.

•

PHILADELPHIA—There has been no change in this district this week. Mills here with the exception of Bethlehem are apparently not too worried about their scrap inventories since some are holding back shipments of certain grades. Shipments from yards continue very light.

•

NEW YORK—Very little scrap is coming out of the yards. Another headache for scrap brokers here is the piling up of three-way solids. It is hoped that some revisions will be made to order M-24-c that will allow open hearths to accept alloy grades. Not much optimism is shown for the forthcoming scrap drive since it is not likely that there will be sufficient labor to hande what scrap is brought out for the appeal.

•

ST. LOUIS — Cast scrap, which had been more plentiful than steel grades, has tightened up considerably, affecting adversely stove plants. Car handlings by dealers were from 25 to 30 per cent fewer for August than July. With smaller receipts, mills continue to melt from their reserves.

•

BUFFALO — Nearly 10,000 tons of scrap, consigned to the Buffalo district's biggest consumer, arrived via the state barge canal from New York City this week. Canal men said the arriving fleets brought only dealer scrap. Latest reports indicate war scrap may come up the waterway in about a month. Yards continued to report light receipts of scrap.

IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

(All Prices Are Per Gross Ton)

	BASIC OPEN HEARTH GRADES		BLAST FURNACE GRADES				ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES										
							Low Phos.		Heavy Structural and Plate			Foundry Steel					
	No. 1 & 2 Hvy. Melt. No. 1 Cp. Blk. Shts. No. 1 & 2 Bundles No. 1 Busheling	Unbaled* Machine Shop Turnings	Mixed Borings and Turnings	Cast Iron Borings	Shoveling Turnings	No. 2 Busheling	Billet, Bloom, Forge Crops	Bar Crops, Punchings Plate Scrap and Cast Steel	3 ft. and Under	2 ft. and Under	1 ft. and Under	2 ft. and Under	1 ft. and Under	Auto. Springs, and Crankshafts	Alloy Free Low Phos. and Sulphur Turnings	Heavy Axle and Forge Turn. First Cut	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton	$20.00	$15.00	$15.00	$16.00	$17.00	$17.50	$25.00	$22.50	$21.50	$22.00	$22.50	$21.50	$22.00	$21.00	$18.00	$19.50	$21.00
Cleveland, Middletown, Cincinnati, Portsmouth	19.50	14.50	14.50	15.50	16.50	17.00	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	17.50	19.00	20.50
Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Point	18.75	13.75	13.75	14.75	15.75	16.25	23.75	21.25	20.25	20.75	21.25	20.25	20.75	19.75	16.75	18.25	19.75
Ashland, Ky.	19.50	14.50	14.50	15.50	16.50	17.00	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	17.50	19.00	20.50
Buffalo, N. Y.	19.25	14.25	14.25	15.25	16.25	16.75	24.25	21.75	20.75	21.25	21.75	20.75	21.25	20.25	17.25	18.75	20.25
Bethlehem, Pa.; Kokomo, Ind.	18.25	13.25	13.25	14.25	15.25	15.75	23.25	20.75	19.75	20.25	20.75	19.75	20.25	19.25	16.25	17.75	19.25
Duluth, Minn.	18.00	13.00	13.00	14.00	15.00	15.50	23.00	20.50	19.50	20.00	20.50	19.50	20.00	19.00	16.00	17.50	19.00
Detroit, Mich.	17.85	12.85	12.85	13.85	14.85	15.35	22.85	20.35	19.35	19.85	20.35	19.35	19.85	18.85	15.85	17.35	18.85
Toledo, Ohio	.....	12.85	12.85	13.85	14.85	15.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis, Mo.	17.50	12.50	12.50	13.50	14.50	15.00	22.50	20.00	19.00	19.50	20.00	19.00	19.50	18.50	15.50	17.00	18.50
Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles; Pittsburg, Cal.; San Francisco	17.00	12.00	12.00	13.00	14.00	14.50	22.00	19.50	18.50	19.00	19.50	18.50	19.00	18.00	15.00	16.50	18.00
Minnequa, Colo.	16.50	11.50	11.50	12.50	13.50	14.00	21.50	19.00	18.00	18.50	19.00	18.00	18.50	17.50	14.50	16.00	17.50
Seattle, Wash.	14.50	9.50	9.50	10.50	11.50	12.00	19.50	17.00	16.00	16.50	17.00	16.00	16.00	15.00	12.50	14.00	15.50

*Baled turnings are $5 per gross ton higher.

BUNDLES: Tin can bundles are $4 below dealers' No. 2 bundles No. 3 bundles are $2 less than No. 1 heavy melting.

AT NEW YORK CITY or Brooklyn, the maximum shipping point price is $15.33 for No. 1 heavy melting, f.o.b. cars, f.a.s. vessel or loaded on truck. Minimum set at $14 per grosston at any shipping point in U. S. Other grades carry differentials similar to those in table. New Jersey prices must be computed on basis of all-rail. At Boston the maximum is $15.05 for No. 1 f.o.b. cars, f.a.s. vessel or loaded on trucks. Shipments from a New England shipping point to a consumer outside New England carry maximum transportation charge of $6.66 per ton.

SWITCHING CHARGES: Deductions for shipping points within basing points (cents per gross ton) are: Pittsburgh, Brackenridge, 55c.; Midland, Johnstown, Sharon, Youngstown, Warren, Weirton, Cleveland, Toledo, Los Angeles, San Francisco, 42c.; Butler, Monessen, Canton, Steubenville, Cincinnati*, Portsmouth, Ashland, Coatesville, Harrisburg, Phoenixville, Bethlehem, Kokomo, Duluth, St. Louis, 28c.; Buffalo, Claymont, 36c.; Conshohocken, 11c.; Atlanta, Birmingham, 32c.; Pittsburg, Cal., 42c.; Middletown, 14c.; Sparrow's Point, 11c.; Chicago, 84c.; Detroit, 53c.; Alabama City, 26c.; Minnequa, 22c.; Seattle, 38c. *At Cincinnati, for basic open hearth grades, foundry steel and auto springs and crankshafts, deduct 80c. per ton.

PITTSBURGH basing point includes switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Cincinnati basing point includes Newport, Ky., switching district. St. Louis includes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco includes switching districts of S. San Francisco, Niles and Oakmont, Cal. Claymont, Del., includes the switching point of Chester, Pa. Chicago includes Gary, Ind., switching district.

MAXIMUM SHIPPING POINT PRICE—Where shipment is by rail or vessel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within a basing point, the price listed in the table above for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation charge by rail or water or combination thereof. In lieu of dock charge add 75c. a ton*, but 50c. if moved by deck scow or railroad lighter. Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points take price listed in table minus applicable switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.* For exceptions see official order.

UNPREPARED SCRAP: For unprepared scrap, maximum prices shall be $3.50 (and in the case of the material from which No. 1, No. 2, and No. 3 bundles are made $4) less maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge $2.50 per ton on consumer-owned unprepared remote scrap (see order). A preparation-in-transit charge for allocated unprepared scrap is provided.

NEW LISTED GRADES: Priced in dollars per gross ton less than No. 1 heavy melting steel. Pit scrap, ladle skulls, slag reclaim, etc., of 85% or more Fe priced—$2; 75 to 85% Fe—$4; under 75% Fe—$8 per ton. Mill scale of 65% or more Fe—$8 per ton. Mill cinder and grindings, shipping point maximum price of $4 per gross ton at all U. S. shipping points.

CHEMICAL BORINGS: No. 1 (new, clean, containing not more than 1 per cent oil), $1 less than No. 1 heavy melting; No. 2 (new, clean, containing not more than 1.5 per cent oil), $2 less than No. 1 heavy melting. If loaded in box cars add 75c.

*At Memphis 50c.; Great Lakes ports $1; New England $1.25.

RAILROAD SCRAP

	No. 1 RR Heavy Melting	Scrap Rails	Rails for Rerolling	Scrap Rails: 3 ft. and Under	Scrap Rails: 2 ft. and Under	Scrap Rails: 18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown	$20.50	$21.50	$23.00	$23.50	$23.75	$24.00
Canton, Pittsburgh, Sharon, Steubenville, Wheeling, Youngstown	21.00	22.00	23.50	24.00	24.25	24.50
Chicago, Philadelphia, Sparrows Pt., Wilmington	19.75	20.75	22.25	22.75	23.00	23.25
Birmingham, Los Angeles, San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Buffalo	20.25	21.25	22.75	23.25	23.50	23.75
Detroit	18.85	19.85	21.35	21.85	22.10	22.35
Duluth	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo.	17.00	18.00	19.50	20.00	20.25	20.50
Kokomo, Ind.	19.25	20.25	21.75	22.25	22.50	22.75
Seattle	15.50	16.50	18.00	18.50	18.75	19.00
St. Louis	18.50	19.50	21.00	21.50	21.75	22.00

CAST IRON SCRAP

	Group A	Group B	Group C
No. 1 cupola cast	$18.00	$19.00	$20.00
Clean auto cast	18.00	19.00	20.00
Unstripped motor blocks	15.50	16.50	17.50
Stove Plate	17.00	18.00	19.00
Heavy Breakable Cast	15.50	16.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Misc. Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C: States not named in A and B; switching district of Kansas City, Kan., Mo.

Tool Steel Scrap Ceiling Prices Set by MPR 379, May 4, 1943

BASE PRICE SEGREGATED

	Solids, Lb. Cont. W	Turnings, Lb. Cont. W
Type 1	$1.80	$1.60
Type 2	1.60	1.40
Type 3	1.25	1.25
Type 4*	0.125	0.105
Type 5*	0.135	0.115

*Per lb. of scrap material.

BASE PRICE UNSEGREGATED SOLIDS

$1.50 per lb. contained W if 5% or more.

$1.15 per lb. contained W if over 1% and less than 5%.

$0.80 per lb. contained Mo if 1½% or more.

BASE PRICE UNSEGREGATED TURNINGS

$1.30 per lb. contained W if 5% or more.

$1.00 per lb. contained W if 1% and less than 5%.

$0.70 per lb. contained Mo if 1½% or more.

Comparison of Prices . . .

Advances Over Past Week in **Heavy Type**; Declines in *Italics*. [Prices Are F.O.B. Major Basing Points]

Flat Rolled Steel: (Cents Per Lb.)	Sept. 14, 1943	Sept. 7, 1943	Aug. 17, 1943	Sept. 15, 1942
Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Plates, wrought iron	3.80	3.80	3.80	3.80
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00
Tin and Terne Plate: (Dollars Per Base Box)				
Tin plate, standard cokes	$5.00	$5.00	$5.00	$5.00
Tin plate, electrolytic	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30
Bars and Shapes: (Cents Per Lb.)				
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars	4.40	4.40	4.40	4.40
Wire and Wire Products: (Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55
Rails: (Dollars Per Gross Ton)				
Heavy rails	$40.00	$40.00	$40.00	$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel: (Dollars Per Gross Ton)				
Rerolling billets	$34.00	$34.00	$34.00	$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00
Wire Rods and Skelp: (Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	2.00
Skelp (grvd)	1.90	1.90	1.90	1.90

Pig Iron: (Per Gross Ton)	Sept. 14, 1943	Sept. 7, 1943	Aug. 17, 1943	Sept. 15, 1942
No. 2 fdy., Philadelphia	$25.84	$25.84	$25.89	$25.89
No. 2, Valley furnace	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti	24.68	24.68	24.68	24.68
No. 2, Birmingham	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa.	25.39	25.39	25.39	25.39
Basic, Valley furnace	23.50	23.50	23.50	23.50
Malleable, Chicago†	24.00	24.00	24.00	24.00
Malleable, Valley	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago	31.34	31.34	31.34	31.34
Ferromanganese‡	135.00	135.00	135.00	135.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.
‡For carlots at seaboard.

Scrap: (Per Gross Ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.85
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	20.00
No. 1 cast, Ch'go	20.00	20.00	20.00	20.00
Coke, Connellsville: (Per Net Ton at Oven)				
Furnace coke, prompt	$6.50	$6.50	$6.50	$6.00
Foundry coke, prompt	7.50	7.375	6.875	6.875
Non-Ferrous Metals: (Cents per Lb. to Large Buyers)				
Copper, electro., Conn.	12.00	12.00	12.00	12.00
Copper, Lake, New York	12.00	12.00	12.00	12.00
Tin (Straits), New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	6.35	6.35	6.35	6.35
Aluminum, Virgin, del'd.	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	22.50
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 155-167.

Composite Prices . . .

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Sept. 14, 1943	2.25513c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One week ago	2.25513c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One month ago	2.25513c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One year ago	2.26190c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1943	2.25513c.,	2.25513c.,	$23.61	$23.61	$19.17	$19.17
1942	2.26190c.,	2.26190c.,	23.61	23.61	19.17	19.17
1941	2.43078c.,	2.43078c.,	$23.61, Mar. 20	$23.45, Jan. 2	$22.00, Jan. 7	$19.17, Apr. 10
1940	2.30467c., Jan. 2	2.24107c., Apr. 16	23.45, Dec. 23	22.61, Jan. 2	21.83, Dec. 30	16.04, Apr. 9
1939	2.35367c., Jan. 3	2.26689c., May 16	22.61, Sept. 19	20.61, Sept. 12	22.50, Oct. 3	14.08, May 16
1938	2.58414c., Jan. 4	2.27207c., Oct. 18	23.25, June 21	19.61, July 6	15.00, Nov. 22	11.00, June 7
1937	2.58414c., Mar. 9	2.32263c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.67, June 9
1936	2.32263c., Dec. 28	2.05200c., Mar. 10	19.74, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.07642c., Oct. 1	2.06492c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29
1934	2.15367c., Apr. 24	1.95757c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.95578c., Oct. 3	1.75836c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.89196c., July 5	1.83901c., Mar. 1	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.99626c., Jan. 13	1.86586c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.25488c., Jan. 7	1.97319c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.31773c., May 28	2.26498c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

. . . Prices of Finished Iron and Steel

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, reductions, and in most cases freight absorbed to meet competition. Delivered prices do not reflect new 3 per cent tax on freight rates.

Basing Point → / Product ↓	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	Pacific Ports, Cars[10]	DELIVERED TO Detroit	New York	Philadelphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled[1]	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	3.67¢
Long ternes[2]	3.80¢		3.80¢									4.55¢		4.16¢	4.12¢
STRIP															
Hot rolled[3]	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold rolled[4]	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.90¢	3.16¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity C-R	2.95¢	3.05¢		2.95¢			2.95¢	(Worcester = 3.35¢)					3.05¢	3.31¢	
TIN MILL PRODUCTS															
Coke tin plate, base box	$5.00	$5.00	$5.00						$5.10					5.36¢	5.32¢
.50 / .75 Electro tin plate, box	$4.50 / $4.65	$4.50	$4.50 / $4.65												
Black plate, 29 gage[5]	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢[12]			3.37¢
Mfg. ternes, special box	$4.30	$4.30	$4.30						$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel[6]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (billet)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢[13]	2.25¢	2.39¢	
Reinforcing (rail)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	2.55¢[13]	2.25¢		2.47¢
Cold finished[8]	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70¢)					2.99¢	2.97¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢	(Bethlehem, Massillon, Canton = 2.70¢)						2.80¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.45¢		
								(Coatesville and Claymont = 2.10¢)							
PLATES															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.35¢		2.45¢	2.65¢	2.31¢	2.29¢	2.15¢
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	3.67¢
Alloy	3.50¢	3.50¢			(Coatesville = 3.50¢)						3.95¢	4.15¢		3.70¢	3.59¢
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	(Bethlehem = 2.10¢)				2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL, C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester = 3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester = 4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester = 6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8.35¢			(Worcester = 8.55¢)								
WIRE[9]															
Bright[14]	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)					3.10¢			2.92¢
Galvanized	add proper size extra and galvanized extra to bright wire base, above.														
Spring (High Carbon)	3.20¢	3.20¢		3.20¢			(Worcester = 3.30¢)					3.70¢			3.52¢
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.72¢

[1] Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. [2] Unassorted 8-lb. coating. [3] Widths up to 12 in. [4] Carbon 0.25 per cent and less. [5] Applies to certain width and length limitations. [6] For merchant trade. [7] Prices for straight length material only, from a producer to a consumer. Functional discount of 25c. per 100 lb. to fabricators. [8] Also shafting. For quantities of 20,000 to 29,999 lb. [9] Carload lot to manufacturing trade. [10] These prices do not apply if the customary means of transportation (rail and water) are not used. [12] Boxed. [13] Portland and Seattle price, San Francisco price is 2.50c. [14] This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

GOVERNMENT CEILING—Price Schedule No. 6 issued April 16, 1941, governs steel mill prices; Price Schedule No. 49 governs warehouse prices which are on another page of this issue.

EXCEPTIONS TO PRICE SCHEDULE No. 6—On hot rolled carbon bars, Phoenix Iron Co. may quote 2.35c. at established basing points, Calumet Steel division of Borg Warner may quote 2.35c., Chicago, on bars from its 8-in. mill; Joslyn Mfg. Co. may quote 2.35c., Chicago base. On rail steel bars Sweets Steel Co. may quote 2.35c., f.o.b. mill. On hot rolled sheets, Andrews Steel Co. may quote for shipment to Detroit area on Middletown base. On galvanized sheets, Andrews Steel may quote 3.75c., at established basing points. On hot rolled strip, Joslyn Mfg. Co. may quote 2.30c., Chicago base. On plates, Granite City Steel Co. may quote 2.35c., f.o.b. mill, and Central Iron & Steel Co. may quote 2.20c., f.o.b. basing points. On shapes, Phoenix Iron Co. may quote 2.30c. established basing points and 2.50c. Phoenixville for export.

On rail steel merchant bars, Eckels-Nye Corp. may charge 2.40c. On tubing, South Chester Tube Co. may price Gulf or Pacific Coast all-rail shipments and shipments west of Harrisburg on basis of f.o.b. Chester. On lend-lease sales to eastern seaboard, Sheffield Steel Co. and Colorado Fuel & Iron Corp. may sell f.o.b. mill. SEMIFINISHED STEEL—Follansbee Steel Corp. may sell forging billets at $49.50 f.o.b. Toronto; Continental Steel Corp. may sell Acme Steel Co. at $34 for rerolling billets plus extras and freight; Ford Motor Co. may sell rerolling billets at $34 f.o.b. Dearborn; Andrews Steel Co. may sell forging billets at $50 at established basing points and slabs at $41; Empire Sheet and Tin Plate may sell slabs at $41 at established basing points and sheet bars at $39 f.o.b. mill; on lend-lease sales Northwestern Steel & Wire Co. may charge $41 per gross ton f.o.b. mill for rerolling billets; on lend-lease sales Wheeling Steel Corp. may charge $36 per ton for small billets, f.o.b. Portsmouth and $37 per ton for sheet bars f.o.b. Portsmouth; Laclede Steel Co. on semifinished sales for lend-lease shipped to eastern seaboard may use Chicago basing point prices f.o.b. Alton and Madison, Ill. ALLOY STEEL BARS—Texas Steel Co. may use Chicago base f.o.b. Fort Worth.

WAREHOUSE PRICES

(Delivered Metropolitan areas, per 100 lb. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. City prices are used in conformance with OPA Schedule 49)

Cities	SHEETS			STRIP		Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 gage)	Cold Rolled	Galvanized (24 gage)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	†† Hot Rolled, 2300	‡ Hot Rolled, 3100	†† Cold Drawn, 2300	‡ Cold Drawn, 3100
*Philadelphia	$3.518	$4.872[5]	$5.018	$3.922	$4.772	$3.605	$3.666	$3.822	$4.072	....	$7.116	....	....
*New York	3.590	4.613[2]	5.010	3.974[6]	4.774	3.768	3.758	3.853	4.103	6.008	7.158	7.303	8.453
*Boston	3.774	4.744	5.224	4.106	4.715	3.912	3.912	4.044	4.144	6.162	7.312	7.344	8.494
*Baltimore	3.394	4.852	4.894	3.902	4.752	3.594	3.759	3.802	4.052	....	....	....	....
*Norfolk	3.771	4.965	5.371	4.165	4.865	3.971	4.002	4.065	4.165	....	....	....	....
*Washington	3.596	4.841	5.196	4.041	4.741	3.796	3.930	3.941	4.041	....	....	....	....
*Chicago	3.25	4.20	5.234	3.60	4.65[8]	3.55	3.55	3.50	3.75	5.75	6.90	6.85	8.00
*Milwaukee	3.387	4.337[2]	5.272[4]	3.737	4.787[8]	3.687	3.687	3.637	3.887	5.987	7.137	7.087	8.237
*Cleveland	3.35	4.40	4.877[4]	3.60	4.45	3.40	3.588	3.35	3.75	5.958	7.106	6.85	8.00
*Buffalo	3.35	4.40	4.754	3.819	4.669	3.63	3.40	3.35	3.75	5.75	6.90	6.85	8.00
*Detroit	3.45	4.50	5.004	3.70	5.909[8]	3.609	3.661	3.45	3.80	6.08	7.23	7.159	8.309
*Cincinnati	3.425	4.475[2]	4.825[1]	3.675	4.711	3.611	3.691	3.611	4.011	....	....	....	....
*St. Louis	3.397	4.247[2]	5.172[4]	3.747	4.931[8]	3.697	3.697	3.647	4.031	6.131	7.281	7.231	8.381
*Pittsburgh	3.35	4.40	4.75	3.60	4.45	3.40	3.40	3.35	3.75	5.75	7.15	6.85	8.25
*St. Paul	3.51	4.46	5.257[4]	3.86	4.35[9]	3.81[9]	3.81[9]	3.76[9]	4.361	6.09	7.24	7.561	8.711
*Omaha	3.865	5.443	5.608[4]	4.215	....	4.165	4.165	4.115	4.443	....	....	....	....
*Indianapolis	3.58	3.58	4.568	4.918	3.768	4.78	3.63	3.58	3.98	6.08	7.23	7.18	8.33
Birmingham	3.45[3]	....	4.75[1]	3.70[3]	....	3.55[3]	3.55[3]	3.50[3]	4.43	....	....	....	....
Memphis	3.85	4.66	5.25	4.10	....	3.95	3.95	3.90	4.31	....	....	....	....
New Orleans	3.95	4.95	5.25	4.20	....	3.90	3.90	4.10	4.60	....	....	....	....
Houston	3.75	5.43	5.25	4.30	....	5.25	5.25	3.75	4.50	....	....	....	....
†Los Angeles	4.95	7.15	5.95	4.90	....	4.90	4.60	4.35	5.70	9.55	8.55	10.55	9.55
†San Francisco	4.55	7.55	6.60	4.50	....	4.65	4.35	3.95	5.55	9.80	8.80	10.80	9.80
†Seattle	4.65[7]	6.63	5.70[7]	4.25	....	4.75	4.45	4.20	5.75	....	8.00	....	....

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb.; galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over: Exceptions: [1] 500 to 1499 lb. [2] 400 to 1499 lb. [3] 400 to 3999 lb. [4] 450 to 1499 lb. [5] 1000 to 1999 lb. [6] 0 to 1999 lb. [7] 300 to 10,000 lb. [8] 2000 to 39,999 lb. [9] 400 to 14,999 lb. At Philadelphia galvanized sheets, 2500 more bundles; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; San Francisco, hot rolled sheets, 400 to 39,999 lb.; galvanized and cold rolled sheets, 750 to 4999 lb.; cold fin. bars, 0-299 lb.; hot rolled alloy bars, 0-4999 lb.; Seattle, cold finished bars, 1000 lb. and over, hot rolled alloy bars, 0-1999 lb.; Memphis, hot rolled sheets, 400 to 1999 lb., galvanized sheets, 150 and over; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lbs.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations.

† Los Angeles, San Francisco and Seattle prices reflect special provisions of amendment No. 2 to OPA Price Schedule No. 49.

†† For zoned cities these grades have been revised to NE 8617-20.

‡ For zoned cities these grades have been revised to NE 9442-45 Ann'ld.

* Base delivered prices according to price zones established by Amendments to RPS 49 including the 3% transportation tax—not including the 6% freight increase of March 18, 1942, rescinded May 15, 1943.

NATIONAL EMERGENCY (N. E.) STEELS

(Hot Rolled Mill Extras for Alloy Content)

Designation	CHEMICAL COMPOSITION LIMITS, PER CENT								Basic Open-Hearth		Electric Furnace	
	Carbon	Manganese	Phosphorus Max.	Sulphur Max.	Silicon	Chromium	Nickel	Molybdenum	Bars and Bar Strip	Billets, Blooms and Slabs	Bars and Bar Strip	Billets, Blooms and Slabs
NE 1330	.28/ .33	1.60/1.90	.040	.040	.20/ .35	....	....	....	.10c	$2.00	....	....
NE 1335	.33/ .38	1.60/1.90	.040	.040	.20/ .35	....	....	....	.10	2.00	....	....
NE 1340	.38/ .43	1.60/1.90	.040	.040	.20/ .35	....	....	....	.10	2.00	....	....
NE 1345	.43/ .48	1.60/1.90	.040	.040	.20/ .35	....	....	....	.10	2.00	....	....
NE 1350	.48/ .53	1.60/1.90	.040	.040	.20/ .35	....	....	....	.10	2.00	....	....
NE 8613	.12/ .17	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8615	.13/ .18	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8617	.15/ .20	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8620	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8630	.28/ .33	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8635	.33/ .38	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8637	.35/ .40	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8640	.38/ .43	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8642	.40/ .45	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8645	.43/ .48	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8650	.48/ .53	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8720	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.20/ .30	.80	16.00	1.30	26.00
NE 9255	.50/ .60	.70/ .95	.040	.040	1.80/2.20	....	....	....	.40c	8.00	....	....
NE 9260	.55/ .65	.75/1.00	.040	.040	1.80/2.20	....	....	....	.40	8.00	....	....
NE 9262	.55/ .65	.75/1.00	.040	.040	1.80/2.20	.25/ .40	....	....	.65	13.00	....	....
NE 9415	.13/ .18	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30c	$26.00
NE 9420	.18/ .23	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9422	.20/ .25	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9430	.28/ .33	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9435	.33/ .38	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9437	.35/ .40	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9440	.38/ .43	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9442	.40/ .45	1.00/1.30	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.85	17.00	1.35	27.00
NE 9445	.43/ .48	1.00/1.30	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.85	17.00	1.35	27.00
NE 9450	.48/ .53	1.20/1.50	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.85	17.00	1.35	27.00
NE 9537*	.35/ .40	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9540*	.38/ .43	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9542*	.40/ .45	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9550*	.48/ .53	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9261	.55/ .65	.75/1.00	.040	.040	1.80/2.20	.10/ .25	....	....	....	....	....	....
NE 9425	.23/ .28	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	....	....	....	....
NE 9545	.43/ .48	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	....	....	....	....

***Recommended for large sections only. Note: The extras shown above are in addition to a base price of 2.70c. per 100 lb., on finished products and $54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished. When acid open-hearth is specified and acceptable add to basic open hearth alloy differential 0.25c. per lb. for bars and bar strip, $5.00 per gross ton for billets, blooms and slabs. The ranges shown above are restricted to sizes 100 sq. in. or less or equivalent cross sectional area 18 in. wide or under with a max. individual piece weight of 7000 lb.**

PRICES

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are $2.00 higher; f.o.b. Duluth, billets only, $2.00 higher. Delivered prices do not reflect new per cent tax on freight rates.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00
Alloy steel: Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton	$54.00

Shell Steel

	Per Gross Ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham. Prices delivered Detroit are $2.00 higher.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Lb.
Pittsburgh, Chicago, Cleveland	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse)

	Base per lb.
High speed	67c.
Straight molybdenum	54c.
Tungsten-molybdenum	57½c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi 3c. higher.

CORROSION AND HEAT-RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F.Billets	15.725c.	16.15c.	19.125c.	23.375c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hot strip	17.00c.	17.50c.	24.00c.	35.00c.
Cold strip	22.00c.	22.50c.	32.00c.	52.00c.

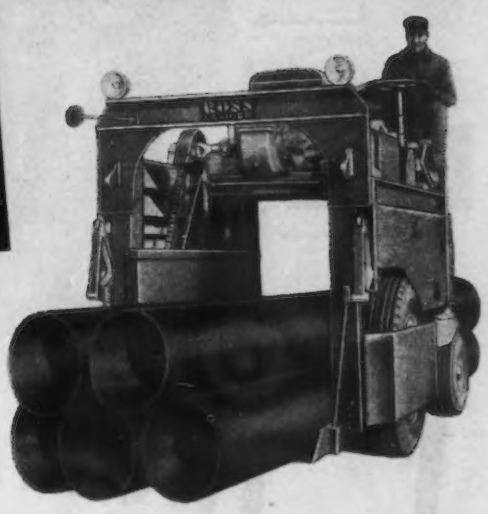
Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

ROSS CARRIERS and LIFT TRUCKS

HANDLE LONG MATERIAL FASTER and at LESS COST!



THE speed with which materials can be fed to the production lines often determines the productive capacity of a plant. In scores of America's war plants ROSS 70-H Carriers and ROSS Industrial Lift Trucks are important links in the production set-up, bridging the gaps between warehouse and factory, and between departments.

Here's why: 1. Long, heavy, bulky materials handled *faster* in and out of storage.

2. Storage facilities utilized to maximum capacity—materials can be stored to greater heights.

3. Need for additional labor is minimized—costs are reduced—man-power can be released for other work.

FLEXIBLE, high-speed, cost-cutting ROSS Carriers and Lift Trucks will help your plant maintain the production necessary to meet today's urgent demands. Our experienced engineers and representatives are at your service, ready to help you solve your handling problems . . . Write today for Bulletin I-93.

THE ROSS CARRIER COMPANY, BENTON HARBOR, MICHIGAN

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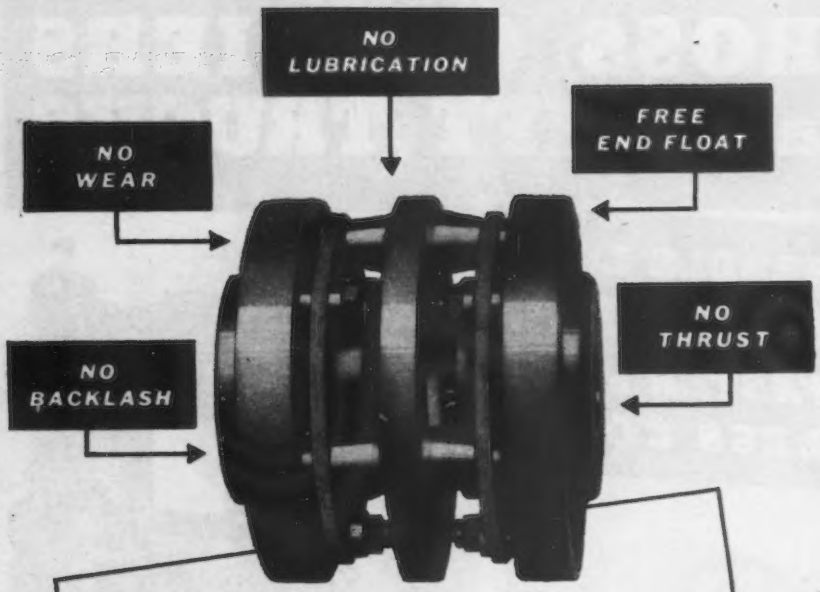
BENTON HARBOR • MICHIGAN



THOMAS FLEXIBLE COUPLINGS

Make Bearings Last Longer

Thomas Flexible Couplings protect bearings from destructive cross-pull and end-thrust by overcoming parallel and angular misalignment of shaft and allowing free end float. Since there are no wearing parts, backlash is eliminated and lubrication is unnecessary. *No other make or type of coupling provides these features,* which are essential to a longer life of trouble-free service for your equipment. Send for a new Thomas catalog which gives specifications on couplings for all purposes.

THOMAS
FLEXIBLE COUPLINGS

THOMAS FLEXIBLE COUPLING CO.
WARREN • PENNA.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts:

	Per Cent Off List
½ in. & smaller x 6 in. & shorter	65½
9/16 & ⅝ in. x 6 in. & shorter	63½
¾ to 1 in. x 6 in. & shorter	61
1⅛ in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed:
(Hexagon or Square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
7/16 in. and smaller	..	64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 to 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full container lots, 10 per cent additional discount.

Stove Bolts

Packages, nuts loose	71 and 10
In packages, with nuts attached	71
In bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York on lots of 200 lb. or over.

Large Rivets (½ *in. and larger*)

	Base per 100 lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$3.75

Small Rivets (7/16 *in. and smaller*)

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5

Cap and Set Screws

	Per Cent Off List
Upset full fin. hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Filister head cap, listed sizes	51

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., No. 1 O.H., gross ton	$40.00
Angle bars, 100 lb.	2.70
(F.o.b. Basing Points)	*Per Gross Ton*
Light rails (from billets)	$40.00
Light rails (from rail steel)	39.00
	Base per Lb.
Cut spikes	3.00c.
Screw spikes	5.15c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast	2.30c.
Track bolts	4.75c.
Track bolts, heat treated, to railroads	5.00c.
Track bolts, jobbers discount	63-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	$6.00	$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00

PRICES

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham

	Base per Keg
Standard wire nails	$2.55
Coated nails	2.55
Cutnails, carloads	3.85
	Base per 100 Lb.
Annealed fence wire	$3.05
Annealed galvanized fence wire	3.40
	Base Column
Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire†	70
Twisted barbless wire	70

*15½ gage and heavier. †On 80-rod spools in carload quantities.

WELDED PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought pipe)

Base Price—$200 per Net Ton

	Black	*Galv.*
Steel (Butt Weld)		
½ in.	63½	51
¾ in.	66½	55
1 to 3 in.	68½	57½
Wrought Iron (Butt Weld)		
½ in.	25	3½
¾ in.	30	10
1 and 1¼ in.	34	16
1¼ in.	38	18½
2 in.	37½	18
Steel (Lap Weld)		
2 in.	61	49½
2½ and 3 in.	64	52½
3½ to 6 in.	66	54½
Wrought Iron (Lap Weld)		
2 in.	30½	12
2½ to 3½ in.	31½	14½
4 in.	33½	18
4½ to 8 in.	32½	17
Steel (Butt, extra strong, plain ends)		
½ in.	61½	50½
¾ in.	65½	54½
1 to 3 in.	67	57
Wrought Iron (Same as Above)		
½ in.	25	6
¾ in.	31	12
1 to 2 in.	38	19½
Steel (Lap, extra strong, plain ends)		
2 in.	59	48½
2½ and 3 in.	63	52½
3½ to 6 in.	66½	56
Wrought Iron (Same as Above)		
2 in.	33½	15½
2½ to 4 in.	39	22½
4½ to 6 in.	37½	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher on all butt weld.

Mr. Subcontractor:
YOU'LL BE NEEDING EXTRA AMPERES FAST
TO MEET INCREASED PRODUCTION DEMANDS!
Here is a chromic acid anodizing arrangement. Rectoplaters can be combined to meet any plating, cleaning or anodizing requirement.

When you are asked to double your output over night. When the walls of your present quarters already bulge from crowding and expansion is impossible. When you can't possibly squeeze in *more* bulky machinery—and you need those extra amperes *fast*. THAT'S A JOB FOR UDYLITE-MALLORY RECTOPLATERS.

Rectoplaters are small, compact units, standardized in design and production, tested by years of actual service in plants all over the country. Each unit delivers 1440 amps at 6 volts or 720 amps at 12 volts. They are easily moved wherever needed, require little floor space and no special installation.

Rectoplaters may be used individually or in series when greater amperage is required. They require no conversion for peacetime use.

(RECTOPLATERS ARE IN STOCK FOR IMMEDIATE DELIVERY)

THE UDYLITE CORPORATION

1651 E. Grand Blvd., Detroit 11, Mich.

Chicago 12, 1943 Walnut Street · Long Island City 1, N. Y., 11-16 44th Drive · Cleveland 3, 4408 Carnegie Ave.

PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima. Delivered prices do not reflect 3 per cent tax on freight rates.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorus	Charcoal
Boston††	*$25.50*	*$25.00*	*$26.50*	*$25.50*	.....	.....
Brooklyn	*27.50*	.....	.....	*28.00*	.....	.....
Jersey City	*26.53*	*26.03*	*27.53*	*27.03*	.....	.....
Philadelphia	*25.84*	*25.34*	*26.84*	*26.34*	*$30.74*	.....
Bethlehem, Pa.	25.00	24.50	26.00	25.50	.....	.....
Everett, Mass.††	25.00	24.50	26.00	25.50	.....	.....
Swedeland, Pa.	25.00	24.50	26.00	25.50	.....	.....
Steelton, Pa.	.....	24.50	.....	.....	29.50	.....
Birdsboro, Pa.	25.00	24.50	26.00	25.50	29.50	.....
Sparrows Point, Md.	25.00	24.50	.....	.....	.....	.....
Erie, Pa.	24.00	23.50	25.00	24.50	.....	.....
Neville Island, Pa.	24.00	23.50	24.50	24.00	.....	.....
Sharpsville, Pa.*	24.00	23.50	24.50	24.00	.....	.....
Buffalo	24.00	23.00	25.00	24.50	29.50	.....
Cincinnati, Ohio	*23.94*	*23.94*	.....	*25.11*	.....	.....
Canton, Ohio	*25.39*	*24.89*	*25.89*	*25.39*	*32.69*	.....
Mansfield, Ohio	*25.94*	*25.44*	*26.44*	*25.94*	*32.86*	.....
St. Louis	*24.50*	*24.50*	.....	.....	.....	.....
Chicago	24.00	23.50	24.50	24.00	*35.46*	.....*$31.34*
Granite City, Ill.	24.00	23.50	24.50	24.00	.....	.....
Cleveland	24.00	23.50	24.50	24.00	*32.42*	.....
Hamilton, Ohio	24.00	23.50	.....	24.00	.....	.....
Toledo	24.00	23.50	24.50	24.00	.....	.....
Youngstown*	24.00	23.50	24.50	24.00	*32.42*	.....
Detroit	24.00	23.50	24.50	24.00	.....	.....
Lake Superior fc.	.....	.....	.....	.....	.....	$34.00
Lyles, Tenn. fc.†	.....	.....	.....	.....	.....	33.00
St. Paul	*26.76*	.....	*27.26*	*26.76*	*39.80*	.....
Duluth	24.50	24.00	25.00	24.50	.....	.....
Birmingham	20.38	19.00	25.00	.....	.....	.....
Los Angeles	*26.95*	.....	.....	.....	.....	.....
San Francisco	*26.95*	.....	.....	.....	.....	.....
Seattle	*26.95*	.....	.....	.....	.....	.....
Provo, Utah	[22.00	21.50	.....	.....	.....	.....
Montreal	*27.50*	*27.50*	.....	*28.00*	.....	.....
Toronto	*25.50*	*25.50*	.....	*26.00*	.....	.....

GRAY FORGE IRON: Valley or Pittsburgh furnace $23.50

*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

**Pittsburgh Ferromanganese Co. (Chester furnace only) may charge $2.25 a ton over maximum basing point prices.

†Price shown is for low-phosphorous iron; high-phosphorous sells for $28.50 at the furnace.

††Eastern Gas & Fuel Associates, Boston, is permitted to sell pig iron produced by its selling company, Mystic Iron Works, Everett, Mass., at $2 per gross ton above maximum prices.

Delta Chemical & Iron Co., Chicago, may charge $30 for charcoal iron at its Delta, Mich., furnace.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 per cent to 2.25 per cent); phosphorous differentials, a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over; manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent. Effective March 3, 1943, $2 per ton extra may be charged for 0.5 to 0.75 per cent nickel content and $1 per ton extra for each additional 0.25 per cent nickel.

Metal Powders

Prices are based on current market prices of ingots plus a fixed figure. For ton lots f.o.b. shipping point, in cents per lb.

Copper, electrolytic, 150 and 200 mesh	21⅛ to 23⅛c.
Copper, reduced, 150 and 200 mesh	20½ to 25⅛c.
Iron, commercial, 100 and 200 mesh	13½ to 15c.
Iron, crushed, 200 mesh and finer	4c.
Iron, hydrogen reduced, 300 mesh and finer	63c.
Iron, electrolytic, unannealed, coarser than 300 mesh	30 to 33c.
Iron, electrolytic, annealed minus 100 mesh	42c.
Iron, carbonyl, 300 mesh and finer	90c.
Aluminum, 100 and 200 mesh.	*23 to 27c.
Antimony, 100 mesh	20.6c.
Cadmium, 100 mesh	$1
Chromium, 150 mesh	$1.03
Lead, 100, 200 & 300 mesh,	11½ to 12½c.
Manganese, 150 mesh	51c.
Nickel, 150 mesh	51½c.
Solder powder, 100 mesh,	8½c. plus metal
Tin, 100 mesh	58¾c.

*Freight allowed east of Mississippi.

BOILER TUBES

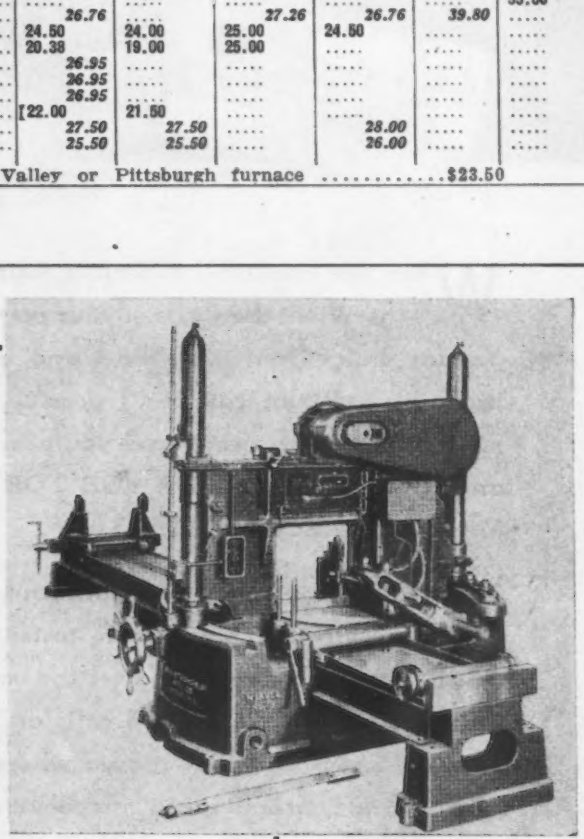
Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes, Minimum Wall. Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots.

	Seamless Cold Drawn	Lap Weld, Hot Rolled	Hot Rolled
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2½ in. o.d. 12 B.W.G.	20.21	17.54	16.58
3 in. o.d. 12 B.W.G.	22.48	19.50	18.25
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66

(Extras for less carload quantities)

40,000 lb. or ft., and over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CUTS the Toughest Steels and Largest Sizes *easily*.



This giant hydraulic metal - cutting saw is more than just a larger hack saw. It is a new development in metal-cutting methods that introduces a new principle of metal sawing — the Roll-stroke blade action makes it possible to cut the toughest steels in the largest sizes easily and rapidly. It also permits a simple and efficient, very low pressure Hydraulic Feed System.

Built for heavy work, completely enclosed in heavy housing, this machine will stand up under the rough usage of the average steel mill warehouse and forge shop, where it will speed cutting-off, and reduce material loss.

MARVEL No. 18
Giant Hydraulic Hack Saw
Capacity 18"x18"

Cuts angles up to 45° by simply swiveling upper machine housing.

Write for Catalog

MARVEL SAWS

ARMSTRONG-BLUM MFG. CO.
"The Hack Saw People"
5700 Bloomingdale Ave., Chicago, U. S. A.

Eastern Sales Office
225 Lafayette St., New York

PRICES

CAST IRON WATER PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. cars, San Francisco or Los Angeles	69.40
6-in. and larger f.o.b. cars, Seattle	71.20

Class "A" and gas pipe, $3 extra; 4-in. pipe is $3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is $45 at Birmingham and $53.80 delivered Chicago, $59.40 at San Francisco and Los Angeles, and $70.20 at Seattle. Delivered prices do not reflect new 3 per cent tax on freight rates.

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports**)

	Per Gross Ton
Old range, bessemer, 51.50	$4.75
Old range, non-bessemer, 51.50	4.60
Mesaba, bessemer, 51.50	4.60
Mesaba, non-bessemer, 51.50	4.45
High phosphorus, 51.50	4.35

*Adjustments are made to indicate prices based on variance of Fe content of ores as analyzed on a dry basis by independent laboratories.

COKE

Furnace

	Per Net Ton
†Connellsville, prompt	$6.50*

Foundry

†Connellsville, prompt	7.50
Fayette County, W. Va. (Beehive)	8.10
By-product, Chicago	12.25
By-product, New England	13.75
By-product, Newark	12.40 to 12.95
By-product, Philadelphia	12.38
By-product, Cleveland	12.30
By-product, Cincinnati	11.75
By-product, Birmingham	8.50†
By-product, St. Louis	12.02
By-product, Buffalo	12.50

Maximum by-product coke prices established by OPA became effective Oct. 1, 1941.

*Hand-drawn ovens using trucked coal are permitted to charge $7.00 per net ton, plus usual transportation. Maximum beehive furnace coke prices established by OPA, Feb. 8, 1942. †F.o.b. oven.

FLUORSPAR

Pursuant to OPA Revised Maximum Price Regulation No. 126, effective July 1, 1943, to Aug. 29, 1943, base price per short ton is set at $33 for 70 per cent or more effective CaF_2 content; $32 for 65 but less than 70 per cent; $31 for 60 but less than 65 per cent; and $30 for less than 60 per cent. F.o.b. consumer's plant (1) plus either railroad freight on such shipment from the producer's shipping point to the consumer's plant, or (2) railroad freight on such a shipment from Rosiclaire, Ill., to the consumer's plant, which ever is lower. On and after Aug. 30, 1943, the maximum price f.o.b. a consumer's plant on any shipment of metallurgical grade fluorspar shall be $30 per short ton. Over $30 may be charged provided the producer receives specific instructions from the Steel Division of WPB to the effect that a specific consumer must have one of the higher grades, as provided in Section No. 4 (b).

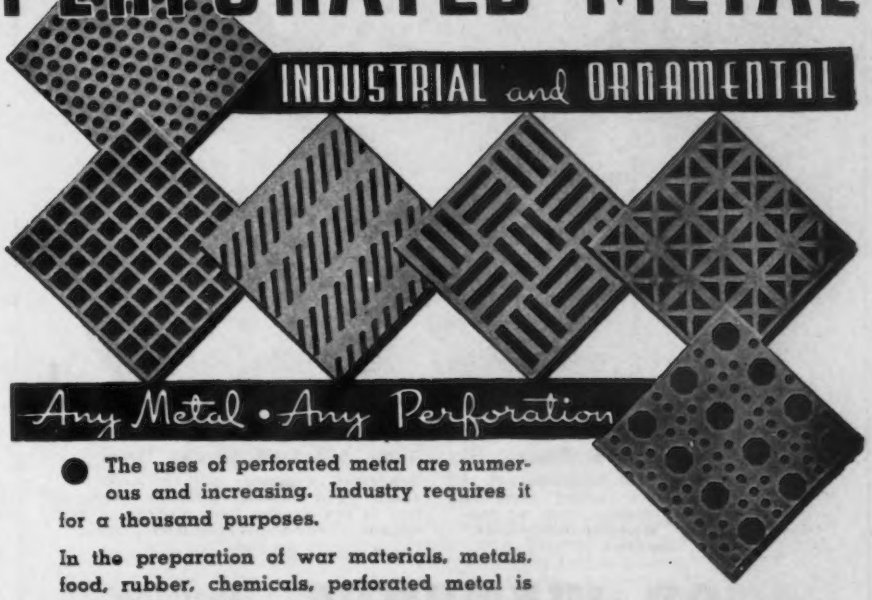
REFRACTORIES

(*F.o.b. Works*)

Fire Clay Brick	*Per 1000*
Super-duty brick, St. Louis	$64.60
First quality, Pa., Md., Ky., Mo., Ill.	51.30
First quality, New Jersey	56.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	46.55
Second quality, New Jersey	51.00
No. 1, Ohio	43.00
Ground fire clay, net ton	7.60
Silica Brick	
Pennsylvania and Birmingham	$51.30
Chicago District	58.90
Silica cement, net ton (Eastern)	9.00
Chrome Brick	*Per Net Ton*
Standard, chemically bonded, Balt., Plymouth Meeting, Chester	$54.00
Magnesite Brick	
Standard, Balt. and Chester	$76.00
Chemically bonded, Baltimore	65.00
Grain Magnesite	
Domestic, f.o.b. Balt. and Chester in sacks (carloads)	$44.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

PERFORATED METAL

INDUSTRIAL and ORNAMENTAL



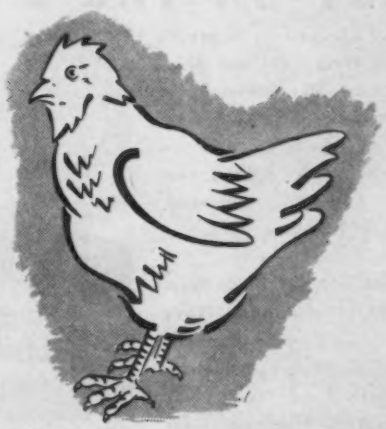
● The uses of perforated metal are numerous and increasing. Industry requires it for a thousand purposes.

In the preparation of war materials, metals, food, rubber, chemicals, perforated metal is required to perform an important role.

The Harrington & King PERFORATING Co.

5657 FILLMORE STREET—CHICAGO 44, ILL.
Eastern Office, 114 Liberty Street, New York 6, N. Y.

How many FEATHERS in a Hen?



Our department of weights and standards, after plucking several specimens, has placed the problem back in our laps with no answer.

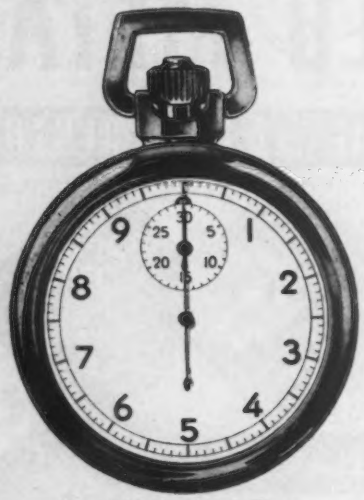
Many spring users have placed spring problems hard to solve in our hands to analyse and standardize. Scientific control of materials, close supervision of manufacture, automatic heat-treating, and accurate inspection and testing will give your springs a uniform degree of performance that eliminates kick-backs.

Buy springs that give known performance!

DUNBAR SPRINGMAKERS

SPRINGS WIRE FORMS SMALL STAMPINGS

DUNBAR BROS. CO., Bristol, Conn.
Division of Associated Spring Corporation



No. 100 Decimal Timer

Graduated in decimal hundredths of a minute; sweep hand making complete revolution in one minute; total registration 30 minutes; "start-stop-and-fly-back" operation.

No. 105 Fifth Second Timer

Graduated in seconds and fifth seconds; sweep hand making complete revolution in one minute; total registration 30 minutes; "start-stop-and-fly-back" operation.

STOP WATCHES *Available for Delivery*

These instruments, produced in one of America's finest plants, contain a high precision, continuous running movement of seven jewels, encased in nickel.

We maintain a complete shop with skilled technicians for quick repairs on all types of stop watches, chronographs and other technical instruments.

M. J. STILLMAN CO., INC.

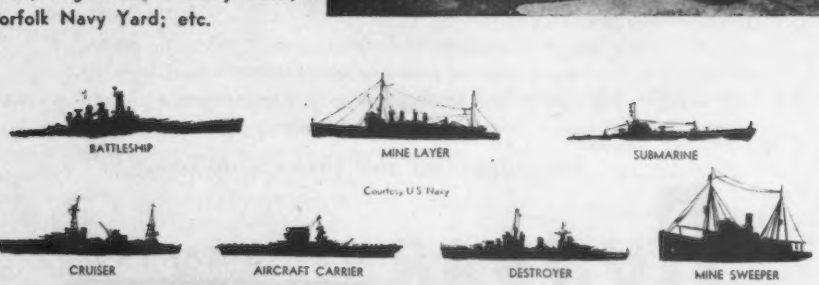
116 South Michigan Avenue **Chicago, Illinois**

BUSY ON THE 2-OCEAN NAVY

Krane Kars are working in practically every Navy Yard and Shipyard building Naval vessels, in the country. Loading, unloading, transporting, stacking, etc., in tight quarters, under difficult conditions . . . speedily, efficiently, safely . . . 168 hours a week.

●

Users: Brooklyn Navy Yard; Seattle-Tacoma; Portsmouth Navy Yard; N. Y. Shipbuilding; Federal; Cramp Shipbuilding; Bethlehem Steel; Puget Sound Navy Yard; Norfolk Navy Yard; etc.



2½, 5, AND 10 TON CAPACITIES

Krane kar

SILENT HOIST WINCH & CRANE CO., 851 63RD ST., BROOKLYN, N.Y.

PRICES

Ferromanganese

78-82% manganese, maximum contract base price per gross ton, lump size, f.o.b. car at Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.

Carload lots (bulk)	$135.00
Ton lots (packed)	141.00
Less ton lots (packed)	148.50

Premium, $1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Electrolytic Manganese

99.9% manganese, maximum base contract price per lb. of metal, bulk, f.o.b. shipping point, with freight allowed to destination. Size, 1" x D.

	Eastern Zone	Central Zone	Western Zone
Carload lots	37.60c.	37.85c.	38.15c.
l.c.l. lots	39.60c.	38.60c.	40.65c.

Spiegeleisen

Maximum base contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 1% max. Si	19-21% Mn 1% max. Si	26-28% Mn 1% max. Si
Carloads	$35.00	$36.00	$49.50
Less ton*	47.50	48.50	62.00

Electric Ferrosilicon

OPA maximum base price cents per lb. contained Si, lump size in carlots, f.o.b. shipping point with freight allowed to destination.

	Eastern Zone	Central Zone	Western Zone
50% silicon	6.65c.	7.10c.	7.25c.
75% silicon	8.05c.	8.20c.	8.75c.

Spot sales 45c. per lb. higher for 50% Si; 30c. for 75% Si. For extras and premiums see MPR 405.

Silvery Iron

(*Per Gross Ton, base 6.00 to 6.50 Si*)

F.o.b. Jackson, Ohio	$29.50*
Buffalo	30.75*

For each additional 0.50% silicon add $1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add $1 a ton for 0.75% phosphorus or over.

*Official OPA price established June 24, 1941.

Bessemer Ferrosilicon

Prices are $1 a ton above silvery iron quotations of comparable analysis.

Silicon Metal

OPA maximum base price per lb. of contained Si, lump size, f.o.b. shipping point with freight allowed to destination, for l.c.l. above 2000 lb., packed.

	Eastern Zone	Central Zone	Western Zone
96% Si, 2% Fe.	13.10c.	13.55c.	16.50c.
97% Si, 1% Fe.	13.45c.	13.90c.	16.80c.

Ferrosilicon Briquets

OPA maximum base price per lb. of briquet, bulk, f.o.b. shipping point with freight allowed to destination. Approximately 40% silicon.

	Eastern Zone	Central Zone	Western Zone
Car lots	3.35c.	3.50c.	3.65c.

Spot prices ¼c. higher per lb. of briquet. For premiums and extras see MPR 405.

Silicomanganese

(*Per gross ton, delivered, carloads, bulk*)

3.00 carbon	$120.00*
2.50 carbon	125.00*
2.00 carbon	130.00*
1.00 carbon	140.00*
Briquets, contract, basis carlots, bulk freight allowed, per lb.	5.80c.†
Packed	6.05c.†
Less ton lots	6.55c.†

*Spot prices are $5 per ton higher.
†Spot prices ¼c. higher.

Ferrochrome

(65-72% *Cr*, 2% *max. Si*)

OPA maximum base contract prices per lb. of contained Cr, lump size in carlots, f.o.b. shipping point, freight allowed to destination.

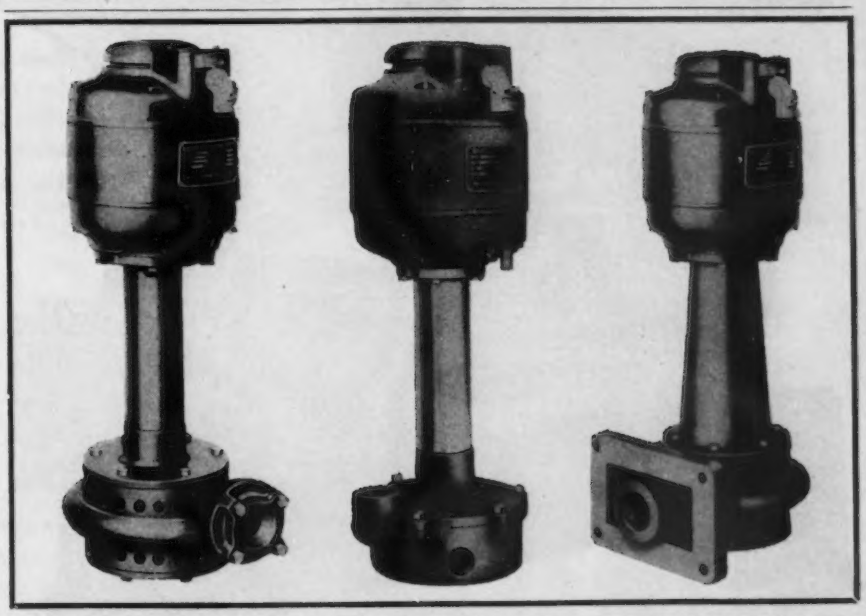
	Eastern Zone	Central Zone	Western Zone
0.03% carbon	25.00c.	25.40c.	26.00c.
0.06% carbon	23.00c.	23.40c.	24.00c.
0.10% carbon	22.50c.	22.90c.	23.50c.
1.00% carbon	20.50c.	20.90c.	21.50c.
2.00% carbon	19.50c.	19.90c.	20.50c.

Spot prices are ¼c. higher per lb. contained Cr. For extras and premiums see MPR 407.

Other Ferroalloys

Ferrotungsten, delivered, carlots, per lb. contained tungsten	$1.90
Tungsten metal powder, 98%-99%, any quantity, per lb.	$2.60
Ferrovanadium, 35%-40%, contract basis, f.o.b. producers plant, usual freight allowances, open-hearth grade, per lb. contained vanadium	$2.70
Special grade	$2.80
Very special grade	$2.90
Vanadium pentoxide, 88%-92% V_2O_5 technical grade, contract basis, any quantity, per lb. contained V_2O_5	$1.10
Ferroboron, contract basis, 17.50% boron minimum, f.o.b. Niagara Falls, carlots, per lb. alloy	$1.20
Ton lots	$1.25
Silcaz No. 3, contract basis, f.o.b. Niagara Falls, all quantities, per lb. of alloy	23c.
Silvaz No. 3, contract basis, f.o.b. Niagara Falls, all quantities, per lb. of alloy	40c.
Grainal, f.o.b. Bridgeville, Pa., freight allowed 100 lb. and over, maximum based on rate to St. Louis, per lb.	45c.
Bortam, f.o.b. Niagara Falls	
Ton lots, per lb.	45c.
Less ton lots, per lb.	50c.
Borosil, 3% to 4% boron, 40 to 45% silicon, f.o.b. Philo, Ohio, per lb. contained boron	$7.00
Ferrocolumbium, 50% to 60%, f.o.b. Niagara Falls, ton lots, per lb. contained columbium	$2.25
Less ton lots	$2.30
Ferrotitanium, 40%-45%, f.o.b. Niagara Falls, N. Y., ton lots, per lb. contained titanium	$1.23
Less ton lots	$1.25
Ferrotitanium, 20%-25%, 0.10 C max., ton lots, per lb. contained titanium	$1.35
Less ton lots	$1.40
High-carbon ferrotitanium, 15%-20%, 6%-8% carbon, contract basis, f.o.b. Niagara Falls, N. Y., freight allowed East of Mississippi River, North of Baltimore and St. Louis, per gross ton	$142.50
3%-5% carbon	$157.50
Ferrophosphorus, 18% electric or blast furnace, f.o.b. Anniston, Ala., carlots, with $3 unitage freight equaled with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage freight equalized with Nashville, per gross ton	$75.00
Ferromolybdenum, 55-75 per cent, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained molybdenum	95c.
Calcium molybdate, 40%-45%, contract basis, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained molybdenum	80c.
Molybdenum oxide briquettes, 48%-52% Mo, f.o.b. Langeloth, Pa., per lb. contained Mo	80c.
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per lb. contained Mo	80c.
Molybdenum powder, 99%, in 200-lb. kegs, f.o.b. York, Pa., per lb.	$2.60
Under 100 lb.	$3.00
Zirconium, 35-40%, contract basis, carloads in bulk or package, per lb. of alloy	15c.
Less ton lots	16c.
Zirconium, 12-15%, contract basis, carlots, bulk, per gross ton	$102.50
Packed	$107.50
Less ton lots	$112.50
Alsifer (approx. 20% Al, 40% Si and 40% Fe), contract basis, f.o.b. Niagara Falls, per lb.	7.50c.
Ton lots	8c.
Simanal (approx. 20% Si, 20% Mn, 20% Al), contract basis, carlots, f.o.b. Phila., Ohio, per lb. ton lots	9.50c.
Less ton lots	10.50c.

The host of spring shapes made at B-G-R would keep the hardest-bitten "doodler" happy for life. Yet every bend or twist has a definite function—or *it wouldn't be there!* B-G-R spring engineers are "doers" *not* "doodlers"—when it comes to spring design. They are interested in making every spring perform a job—in the most efficient way. Even the simplest spring design may require the services of every department at B-G-R—from laboratory—to tool room—to machine—to heat-treating—to inspection. B-G-R's answer to spring complexities is—simplification. It saves time—materials—and tempers. Get the benefit of B-G-R spring skill today.



IMMERSED TYPES • PIPE CONNECTED • FLANGE MOUNTED

Cutting tools—like humans—sometimes get hot and bothered. But there is a simple remedy for the tools. Use Ruthman Gusher Coolant Pumps, and the tools will get all the coolant they want when they want it—instantly.

And your maintenance men will keep cooler, too, because upkeep is less with Ruthman Pumps. That's why you see Ruthman Pumps on machine tools wherever you go.

THE RUTHMAN MACHINERY COMPANY • CINCINNATI, O.

RUTHMAN *Coolant Pumps*

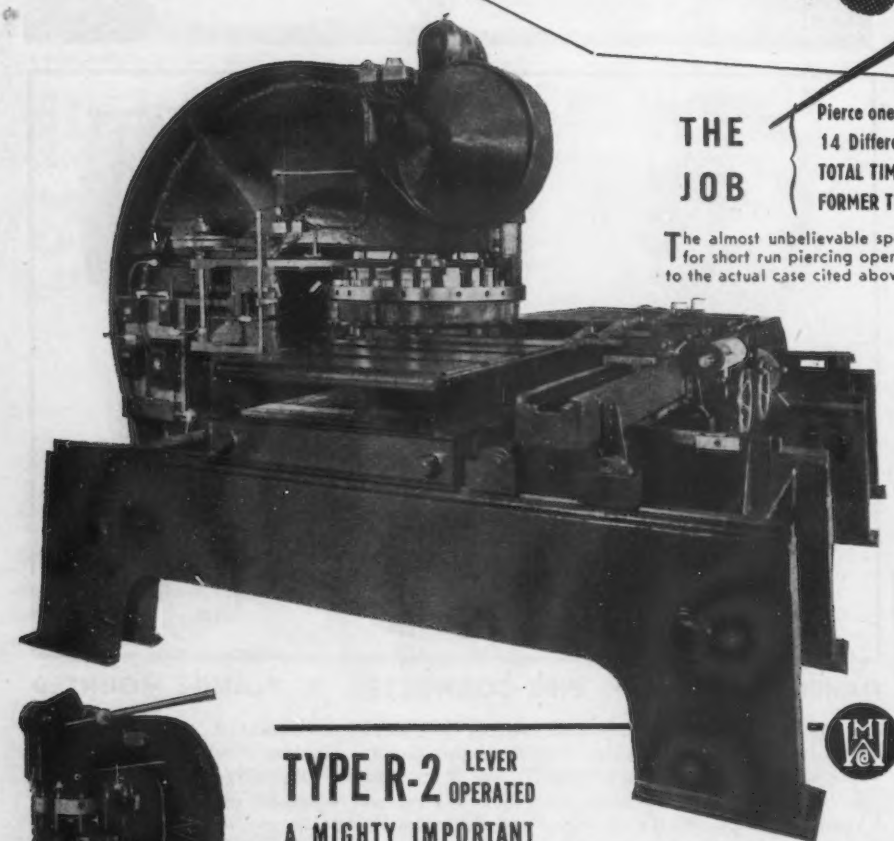
A STORY OF SHORT RUN PIERCING ECONOMY

TO PUNCH ONE PIECE COSTS .78

INSTEAD OF FORMER $7.83 COST....

on a WIEDEMANN TYPE R-7 TURRET PUNCH PRESS with GAUGE TABLE

...A PER PIECE SAVING OF $7.05



THE JOB

Pierce one panel: .125" x 37⅝ x 53⅝ mild steel
14 Different Dies — 108 Different Holes Pierced
TOTAL TIME FOR ONE PIECE — 40.11 min. (one operator required)
FORMER TIME — Old Equipment — 6½ hrs. (2 operators required)

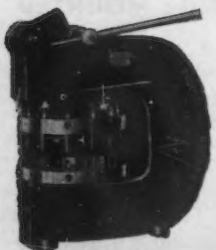
The almost unbelievable speed and accuracy of Wiedemann Turret Punch Presses for short run piercing operations is attested by hundreds of users' reports similar to the actual case cited above.

The Wiedemann Turret Punch Press is the only truly economical method of short-run production for any sheet metal or plate shop in the aircraft, electrical, electronic, industrial sheet metal, radio, and shipbuilding industries. It is ideal equipment for production, experimental and laboratory piercing of sheets or plates.

Type R-7 shown (on which example was produced) exerts a pressure of 160,000 lbs. 24 to 32 stations with 54" throat depth. Only one operator required for any job. Layout and piercing is performed in same operation — all layout readings are taken from blueprint or chart — and are immediately positioned on gauge table and work is pierced.

Get the facts — Write today for new bulletin about the Wiedemann Economy Piercing Method.

WIEDEMANN MACHINE CO.
1817 Sedgley Ave., Philadelphia, Pa.



TYPE R-2 LEVER OPERATED

A MIGHTY IMPORTANT PUNCH PRESS FOR EVERY METAL WORKING SHOP

Replace drilling operations and punching with hand tools. Eliminate changing of punches and dies. R-2 punches smaller die holes in mild steel up to ¼" clean enough to be tapped. No distortion even up to full capacity of 15,000 lbs. All punches equipped with centers. As good for experimental work as for production small run piercing. Write for details on R-2—the time and money saver for every shop.

WIEDEMANN TURRET PUNCH PRESSES & GAUGE TABLES